

# DC-88

with X-Insight

## Ultrasound System

### Datasheet



**mindray**

## Performance Specifications

### System Overview

#### Application

- Abdomen/General
- Obstetrics
- Gynecology
- Cardiology
- Small parts
- Urology
- Vascular
- Pediatrics
- Emergency & Critical
- Nerve
- Pelvic Floor
- Others

#### Transducer Types

- Curved array transducer
- Linear array transducer
- Phased array transducer
- Endocavity array transducer
- 4D Volume transducer

#### Transducer Technology

- 3T with single crystal transducers
- ComboWave transducers

#### 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
- Smart 3D™ (Freehand 3D)
- 4D
- Stress Echo
- Tissue Tracking with Quantitative Analysis
- STE Imaging (Sound Touch Elastography)
- STQ Imaging (Sound Touch Quantification)
- Natural Touch Elastography Imaging
- UWN Contrast Imaging
- iScape™ View (Panoramic Imaging)

#### Standard Features

- B-mode
- THI and PSH™
- M-mode
- Color 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)
- X-Engine
- 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
- 5 active universal probe ports, 1 more for pencil probe only
- 1TB hard drive and 128G SSD
- DVD R/W drive
- Built-in wireless adapter
- 5 USB 3.0 ports, 1 more dedicated
- USB port for printer
- Touch gestures
- iStorage
- MedSight
- MedTouch
- iScanHelper
- Smart Doppler
- Smart Track
- Z-tracking™

#### Optional Features

- Continuous Wave Doppler
- ECG
- Free Xros M™
- Free Xros CM™
- iScape™ View
- Smart 3D™
- Real-time 4D
- iPage+ (Multi-Slice Imaging)
- SCV+ (Slice Contrast View)
- STIC (Spatio-Temporal Image Correlation)
- Color 3D
- Niche/3 Slice
- iLive
- IVF package
- Smart Planes CNS
- Smart Face
- Smart FLC
- Smart-V™ (Smart Volume)
- Auto IMT
- Natural Touch Elastography
- STE Imaging (Sound Touch Elastography)
- STQ Imaging (Sound Touch Quantification)
- UWN Contrast Imaging™
- Quantification Analysis Software
- Auto EF
- TDI (Include TVI, TVD, TVM, TEI)
- TDI QA (TDI Quantitative Analysis, including strain/strain rate)
- LVO (Left Ventricular Opacification)



- Stress Echo
- Tissue Tracking with Quantitative Analysis
- Smart Pelvic
- DICOM
- Clinical Measurement Package
- Smart OB™ (Auto OB measurement)
- Smart NT™ (Auto NT measurement)
- iWorks™ (Auto Workflow Protocol)
- iNeedle™ (Needle Visualization Enhancement)
- Stress Echo
- Built-in battery
- Built-in wireless adapter
- Gel warmer

#### Language Support

Software:	English
Keyboard input:	English
User manual:	English

#### Physical Specifications

##### Dimension and Weight

Depth:	825 ± 5 mm
Width:	575 ± 5 mm
Height:	1090 ± 5 mm ~1620 ± 5 mm
Weight:	Approx. 85Kg (no peripherals, with built-in batteries) (battery weight: 1.03Kg)

#### Monitor

21.5-inch high resolution color LED monitor	
Resolution:	1920 × 1080
Viewing angle:	89° left/right/up/down
Digital on-screen display of brightness and contrast controls.	
Independent tilt up of 110 degrees from horizontal and swivel left/right of -90 to 90 degrees.	
Frame rate (Hz):	60 Hz

#### Audio Speakers

Stereo audio speakers	
Audio data range:	130 Hz ~ 15 kHz

#### Multi-Directional Articulating Monitor

#### Arm for Better User-Friendly Experience

Dual-wing floating arm

## Performance Specifications

Rotate angle: 90 degrees to the left and 150 degrees to the right along with the support arm

Up: 150 mm

Front/back: 300 mm

### Wheels

Diameter: 125 mm

Castors (4 ea): total lock and break

### Probe Port and Holder

Probe ports: 5 active ports, 1 more for pencil probe only

Detachable probe holder: 7 as standard, including one dedicated holder for endocavity probe

### Electrical Power

Voltage: 100 - 240V~

Frequency: 50/60 Hz

Power consumption: Max. 630 VA

A/D-converter velocity (MHz): 40 (receiving)

### Operating Environment

Ambient temperature: 0 - 40 °C

Relative humidity: 30% - 85% RH (no condensation)

Atmospheric pressure: 700 hPa - 1060 hPa

### Storage & Transportation Environment

Ambient temperature: -20 - 55 °C

Relative humidity: 20% - 95% RH (no condensation)

Atmospheric pressure: 700 hPa - 1060 hPa

### User Interface

#### Control Panel

User-centric control panel with home-based layout favors easy access to keys.

Backlit keys ensure accurate work in a dark room.

8 Programmable keys available for user-defined functions (<P>, <Save>, <Print>, <F3 - F6>, and F12).

8-segment TGC control

Full-sized, backlit QWERTY keyboard for text input, function keys and system programming.

Adjustable key volume and trackball speed meet different needs.

Dedicated palm rest design to help reduce user repetitive stress injury.

Independent rotation and up/down of control panel facilitates optimal positioning.

- rotate: 45 degrees (from center)

- down/up: 140 mm (pull 50 mm range)

#### Touch Screen

13.3-inch ultra-slim multi-touch screen

Resolution: 1920 × 1080

Touch screen panel

angle adjustable for easy visualization: 30 degrees in rotation

Digital brightness and contrast adjustment through preset.

Viewing angle: 85 degrees left/right/up/down

Support touch screen gestures

Support thin latex gloves on touch screen

#### Supported Touch Gestures

Image mapping on touch screen: swipe down from the top edge to project image from monitor to touch screen. Swipe up from the bottom edge to remove projected image and show regular parameter interface.

Page up and down: swipe horizontally on regular imaging parameter interface to change different pages; or swipe horizontally on projected images/cine loops to review them one by one.

Menu display: swipe from left edge to right to show the hidden menu on projected image.

Image parameter adjustment

Measurement on projected image on touch screen

Zoom in/out the projected image on touch screen

Rotate or erase on projected 3D/4D image on touch screen.

8 user-defined gestures using two fingers for more functions, such as freeze, save, print, activate specific imaging modes, measurements, and some other special functions.

#### System Boot-Up

Boot-up from complete shut-down in less than 60 sec.

Shut-down in less than 30 sec.

#### Comments

Supports text input and arrow

Support freehand marking on touch screen

Adjustable text size and arrow size

Supports home position

Covers various application

User customizable

#### Body Mark

More than 144 body marks for versatile application

User customizable

#### Numbers of Exam Mode Presets

39 system exam modes (unlimited number for user-defined ones).

#### Screen information

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 Trackball indices

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

#### Imaging Parameters

##### Overview

Echo-enriched beamforming

Up to 82,944 channels

12 - beamforming

##### B-Mode

Display formats

iClear™

iBeam™

iTouch™

Dual Live

Image quality

B steer

ExFOV

Depth

Frame rate (max)

Acoustic output power

TGC

LGC

Dynamic range

Gain

Focus number

Focus position

FOV

Line density

Persistence

Horizontal scale

## Performance Specifications

L/R flip and U/D flip  
 Rotation  
 TSI  
 Gray Map  
 Tint map  
 Middle Line  
 Echo Boost  
 Auto Merge  
 iNeedle  
 Ref Lines  
 Dehaze

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

### M-mode

Display formats  
 Color M-mode available  
 Acoustic output power  
 Dynamic range  
 Gain  
 Depth  
 M sweep speeds  
 M soften  
 Tint map  
 Gray Map  
 Edge enhance  
 Focus position  
 Image quality  
 Time Mark

### Free Xros M™ (option)

Display formats  
 Color Free Xros M available  
 Up to 3 lines  
 Display all lines  
 Sweep speeds  
 M Tint map  
 Gray Map  
 Angle  
 Display

### Free Xros CM™ (option)

Only available in TDI mode  
 Display formats  
 Acoustic output power  
 Gain  
 Sweep speeds  
 Tint map  
 Gray Map  
 Edit, undo, delete function for curved line

### Color Doppler Imaging

Dual live  
 HR Flow™: High Resolution Flow provides

better image quality and flow sensitivity.

Image quality  
 Steer  
 Max frame rate  
 Acoustic output power  
 Gain  
 ROI size/position  
 Scale  
 Baseline  
 Wall filter  
 PRF  
 Packet size  
 Flow state  
 Smooth  
 B/C align  
 Priority  
 Color map  
 Invert  
 Persistence  
 Velocity tag  
 Line density  
 Auto Invert  
 iTouch™  
 B Display  
 Smart Track

### Power Doppler Imaging

Dual live  
 HR Flow™: High Resolution Flow provides better image quality and sensitivity.

Support directional power Doppler  
 Image quality  
 Acoustic output power  
 Dynamic range  
 Gain  
 ROI size/position  
 Scale  
 Wall filter  
 PRF  
 Packet size  
 Flow state  
 Smooth  
 B/C align  
 Priority  
 Color map  
 Directional color map  
 Persistence  
 Line density  
 Steer  
 Invert  
 iTouch™  
 B Display

### PW/CW-Mode

Display formats  
 Image quality

Sample volume size  
 Sample gate depth  
 PW Scale  
 CW Scale  
 Baseline  
 PW Steer  
 Volume  
 PW PRF  
 CW PRF  
 Gain  
 Dynamic range  
 Sweep speed  
 Wall filter  
 Invert  
 Auto invert  
 Angle correction  
 Quick angle  
 Gray map  
 Tint map  
 Time/frequency resolution  
 Auto calc  
 Auto calc cycle  
 Trace area  
 Duplex/Triplex  
 HPRF  
 Auto calc Parameter  
 Trace Sensitivity  
 Trace Smooth  
 Time Mark

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

Available on phased array transducer  
 Dual live  
 Max frame rate  
 PRF  
 Acoustic output power  
 Gain  
 Dynamic range  
 ROI size/position  
 Scale  
 Baseline  
 Wall filter  
 Packet size  
 Tissue state  
 Smooth  
 B/C align  
 Priority  
 TVI maps  
 TEI maps  
 Invert  
 Persistence  
 Velocity tag (TVI only)  
 Line density  
 Image quality

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

Available on phased array transducer  
 Display formats

## Performance Specifications

Sample volume size  
 Sample gate depth  
 Scale  
 Baseline  
 Volume  
 PRF  
 Gain  
 Dynamic range  
 Sweep speed  
 Wall filter  
 Invert  
 Auto invert  
 Angle correction  
 Quick angle  
 Gray map  
 Tint map  
 Time/frequency resolution  
 Image quality  
 Duplex/Triplex  
 iTouch

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

Display formats  
 Dynamic range  
 Gain  
 M sweep speeds  
 M soften  
 Gray Map  
 Edge enhancement

### Smart 3D™

Smart 3D  
 - Acquisition Method  
 - iClear  
 - Acquisition mode  
 - VR  
 - MPR  
 - Display formats  
 - VOI  
 - Reset  
 - Active quadrant  
 - VR orientation  
 - Inversion  
 - Accept VOI  
 - Flip  
 - Sync  
 - Render modes  
 - View direction  
 - Threshold  
 - Opacity  
 - Smooth  
 - Brightness  
 - Contrast  
 - Tint  
 - Face+  
 - MagiClean  
 - Hyaline: Adjust the merging ratio of two render modes

Hyaline and iLive  
 - Thickness  
 - Depth VR  
 Auto rotation  
 - Rotation control  
 - Direction  
 Image Editing  
 - Area selection  
 - Undo  
 - Eraser  
 - Edit diameter

### 4D (option)

Available on all volume transducers

#### Static 3D and 4D

- 4D frame rate  
 - iClear  
 - VR  
 - MPR  
 - Display formats  
 - VOI  
 - Reset  
 - Active quadrant  
 - VR orientation  
 - Inversion  
 - Accept VOI  
 - Flip  
 - Sync  
 - Render modes  
 - Face+  
 - View direction  
 - Threshold  
 - Opacity  
 - Smooth  
 - Brightness  
 - Contrast  
 - Tint  
 - Depth VR

#### Color 3D

- Supports Color and Power mode  
 - Available in both Smart 3D and Static 3D

#### STIC

- Color STIC available  
 - Acquiring Time  
 - Support iPage+ viewing  
 - CMPR available  
 - SCV+ available  
 - 3 Slice and Niche available

#### iPage+

- Slice display mode: Slice only, Slice with SCV  
 - Slice cut direction  
 - Slice layout  
 - Active quadrant  
 - Reset  
 - Spacing  
 - Thickness  
 - Slice Number  
 - Slice Position

- Brightness  
 - Contrast

### SCV+

- Display mode  
 - Reset  
 - Thickness  
 - Active quadrant  
 - Brightness  
 - Contrast  
 - Render modes  
 - Rotate RL  
 - Reverse  
 - SCV Enhance  
 - Opacity  
 - Trace Options  
 - Reset Curve, undo last  
 - MPR Measurement types  
 - Support labeled measurements

### CMPR™

- Trace Options  
 - Active Quadrant  
 - Reset Curve  
 - Rotate RL

### 3D Layout

- 3 Slice  
 - Niche  
 - Reset  
 - Active Quadrant  
 - Niche Views

### iLive

- Shading  
 - Move Light  
 - Light Position  
 - Render Modes  
 - Soft View  
 - Grad View

### Smart FLC (Smart Follicle)

- Automatic follicle calculation  
 - Edit ROI and detect follicle contour automatically  
 - Undo  
 - Active Quadrant

### - Calc

### - Edit

### Smart Planes CNS

- Available on SD8-1E transducer  
 - Detect automatically the standard sections of TCP, TTP, MSP and TVP  
 - Rotation around X/Y/Z axes  
 - Reference line  
 - Reset  
 - Thickness  
 - 3D iClear  
 - Brightness  
 - Contrast  
 - Auto comment supported  
 - Auto measurement supported  
 - Support editing measurement results

## Performance Specifications

- Hide/show measurement results
- MSP adjust
- Support comment and bodymark on sectional plane

### Smart Face

- Recognize fetal face automatically and then display the face in a recommended viewing angle
- FaceContact: -15 ~ 15

### Smart-V™

- Auto 3D volume calculation
- Manual ROI on A, B, C plane separately
- Auto detect contour of target
- Volume result shows in result window

### MPR Measurement

- Measurement types
- Support labeled measurements

### Smart Track

Available on linear transducers in Upper Ext Artery, Upper Ext Vein, Lower Ext Artery, Lower Ext Vein, carotid, IMT EM Vascular exam.

Enable the function under Color/Power mode, the angle and the position of the ROI are adjusted automatically.

Enable the function under Color/Power+PW mode, the angle and the position of the PW sampling line, SV size, SV angle and SV position are adjusted automatically.

### iScape™ View

- Available on all transducers
- Acquisition method
- Supports speed indicator
- Actual size
- Fit size
- Ruler
- Tint map
- Rotation

### Natural Touch Elastography (option)

Available on L12-3E, L9-3E, and L14-5WE transducers in small part exam mode; L20-5E transducer in musculoskeletal exam mode; DE11-3E and V11-3HE in gynecology and prostate exam modes.

Support strain ratio measurement

Unique shell analysis function

Stress compensation technology reduces deeper tissue artifacts, obtains more uniform stress throughout whole field.

Stress indicator

Display format

Elasto Map

Smooth

Invert

Opacity

ROI size/position

Focus Position

Depth

### STE Imaging (Sound Touch Elastography Imaging)

The SC6-1E probe supports the STE imaging in abdomen exam mode; the L12-3E, L9-3E, and L14-5WE probes support the STE imaging in breast, thyroid, and musculoskeletal exam mode.

Display Format

Invert

HQ Elasto

HF Elasto

Image Quality

Elas.Metric

Scale

Opacity

Map

ROI Width/Height

ROI Center Depth

iLayering

Filtering

RLB View

M-STB Index

M-STB Sensibility

iNatural

Smooth

Persistence

Map Position

### STQ Imaging (Sound Touch Quantification Imaging)

The SC6-1E probe supports the STQ imaging in abdomen exam mode; the L12-3E, L9-3E, and L14-5WE probes support the STQ imaging in breast, thyroid, and musculoskeletal exam mode.

ROI Adjustment

Elasto Curve and Metric

E bar

M-STB Index

M-STB Sensibility

Filtering

Smooth

Persistence

High FR

Map Position

Lesion

The square height of the elasto curve represents the average value of the elasto metric for current frame.

Scale

E Avg

HQElasto

### Smart Pelvic

Including auto evaluation package for anterior pelvic compartment, and auto evaluation package for anal levator hiatus.

This feature is available only under GYN or pelvic floor exam mode in 2D or 3D/4D imaging mode.

Set Rest and Valsalva frames

Measure automatically

### Stress Echo (option)

Available on P7-3E/SP5-1E in cardiac exam mode  
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.

ASE 16 (with score 4-7), ASE 17 (with score 4-7)

Customized stages

View: standard views (PSLA, PSAX, A4C, A2C), and customized views

### Image acquisition

- R-wave trigger
- Acquire mode
- Ability to acquire frames or clips in B-mode, M-mode, Color, PW, and TDI

### Image selection

- Attach the images with view annotation label (PSLA, PSAX, A4C, A2C, and customized views)

### Review

- Automatically adjust to the number of images user-defined

### Wall Motion Scoring

- ASE 16 (with score 4-7), or ASE 17 (with score 4-7)
- Graphical display of scoring (Normal, Hyperkinetic, Severely Hyperkinetic, Akinetic, Dyskinetic) LV volume measurement
- Measurement of LV Volume in all phases of cardiac cycle
- Reporting for both Wall Motion Scoring and LV volume measurement

### iBeam™

- Spatial compound imaging
- 9 angles maximum
- Available on all convex and linear transducers

### iClear™

- Speckle suppression imaging
- Available for B, 3D, 4D

### iTouch™

- Auto image optimization
- B-mode
- Color
- Power
- PW
- Contrast imaging

### 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

## Performance Specifications

### ExFov

Extended field of view  
Available for all convex, linear and volume transducers.

### Zoom

Zoom  
iZoom

### QSave

Quick save image parameter setting after image adjustment done.  
Support Save, Save as, Restore

### Auto EF

Output EDV/ ESV/ EF/ SV/ CO by Simpson method  
Activated with or without ECG  
Adjustment for the border of endocardium by single point or multi points  
Adjust Frame  
Layout  
Diastole FR  
Systole FR  
Volume curve

### TDI QA (option)

Dedicated quantification tool for TDI velocity, strain, strain rate analysis  
Ellipse ROI, Standard ROI  
Up to 8 of ROI  
Delete all  
Delete current  
ROI tracking  
Smooth  
X scale  
Std.Height  
Std.Width  
Std.Angle  
Export

### iNeedle (option)

Needle visualization enhancement  
Available on all linear transducers  
Needle steer

### iScanHelper

Tutorial functions as a guide to show basic scanning skill with graphic of probe position, schematic of anatomy, and example clinical image.  
Supports ABD, SMP, URO, OB, GYN applications.

### UWN Contrast Imaging (option)

UWN (Ultra-Wideband Non-linear) contrast imaging technology, which provides exceptional contrast agent detecting capability, not only extracts second harmonic, but also non-linear fundamental signals.  
Available on SC6-1E transducers  
Supports Low MI contrast imaging

### Micro Flow Enhancement (MFE) available

Timer1  
Timer2  
Pro capture  
Retro capture  
Dual live  
MFE  
MFE period  
Destruct  
Destruct voltage  
Destruct time  
iClear  
Mix  
Mix map  
Persistence  
Dynamic range  
Gray map  
Tint map  
Supports U/D Flip and L/R Flip  
Rotation  
CEUS Position  
Line density  
FOV  
FOV size/position  
ExFov  
Gain  
iTouch  
Image quality  
Depth  
TGC  
Acoustic output power

The DC-88 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 make no claims concerning the safety or effectiveness of contrast agents.

### UWN Contrast Imaging Quantitative Analysis (option)

Support Time-Intensity Curve analysis  
Table display  
Freehand ROI  
Up to 8 ROIs  
Delete all  
Delete current  
Fit curve  
Raw curve  
Motion tracking  
X scale  
Export

### LVO (option)

Only available on SP5-1E

### Dedicated left ventricle contrast imaging

### Tissue Tracking with Quantitative Analysis (option)

Available on P7-3E/SP5-1E in adult cardiac/cardiac-difficult (car-penetration)/pediatric cardiac/neonatal cardiac.  
Tissue tracking quantitative analysis  
Mandatory ECG connection before TT QA cine acquisition  
Six views for analysis  
Reload  
Edit  
Start tracking  
Accept & compute  
Display effect  
Trace method  
Bull's eye  
LGC  
Valve's open and close time index  
Data export  
Cycle  
Auto play  
Thickness  
Track point  
Parameter  
Smooth

### Cine Review and Raw Data Processing

#### Cine Review

Available in all modes  
Frame by frame manual cineloop review or auto playback with variable speed  
Maximum cine memory up to 24461 frames or 427s (M)  
Maximum 4D cine memory up to 16215 frames  
Retrospective and prospective storage are available and length is pre-settable (Max. time 480s, Max. frames: 480035).  
Frame compare  
Image/cine compare  
Jump to first and jump to last

#### Raw Data Processing

B-mode:  
TGC  
Gain  
Dyn Ra.  
Gray Map  
Tint Map  
iClear  
L/R Flip  
U/D Flip  
Rotation  
LGC  
Dual Live  
Auto Merge  
H Scale

## Performance Specifications

- Echo Boost
- M-mode:
  - Gain
  - Speed
  - Dyn Ra.
  - Gray Map
  - Tint Map
  - Edge Enhance
  - Time Mark
- Color:
  - Gain
  - Baseline
  - Smooth
  - Color Map
  - Priority
  - Dual Live
  - Invert
  - Velocity tag
  - B display only
- PW:
  - Gain
  - Baseline
  - Volume
  - Angle
  - Speed
  - Dyn Ra.
  - Gray Map
  - Tint Map
  - Invert
  - WF
  - Quick Angle
  - T/F Res
  - Auto Calculate
    - Auto Calc Cycle
    - Auto Calc Parameter
    - Trace Sensitivity
    - Trace Smooth
    - Trace Area
  - Time Mark

### Measurement/Analysis and Report\*

#### Generic Measurements

- 2D-mode
  - Distance
  - Ellipse
  - Trace
  - Spline
  - Cross
  - Angle
  - Double Dist
  - Trace Len
  - Trace Len(Spline)
  - Parallel
  - IMT
  - B-Profile
  - B-Hist(Ellipse)
  - B-Hist(Trace)

- B-Hist(Spline)
- B-Hist(Rectangle)
- Depth
- Color Vel
- Strain Hist
- Color Vel Profile
- -----
- Volume
- Volume(Ellipse)
- Volume(E+Dist.)
- Ratio(D)
- -----
- Volume
- Volume(Ellipse)
- Volume(E+Dist.)
- Ratio(A)
- Area1
- Area2
- Strain Ratio
- A
- B
- Volume Flow
- Vas Area
- TAMEAN
- TAMAX
- M-mode
  - HR
  - HR (R-R)
  - Slope
  - Distance
  - Time
  - Velocity
- Doppler mode
  - PS/ED
  - Vel
  - HR
  - HR (R-R)
  - Time
  - Acceleration
  - D Trace
  - -----
  - Ratio(Vel)
  - Ratio(VTI)
  - -----
  - Volume Flow
  - Vas Area
  - TAMEAN
  - TAMAX
- Automatic Doppler Spectrum Analysis
  - Heart cycle pre-settable (1, 2, 3, 4, 5)
  - Automatic real-time and retrospective tracing
  - User-configurable display of items
  - Support PI, RI, TAMAX, TAMEAN, Volume Flow calculations
  - Appropriate factory setting
- Specific report template by application
- User-defined report template
- Editable value in report

- Images selectable
- Able to Export as PDF/RTF file

#### Auto IMT

- Intima-Media Thickness Measurement
- Automatic detection of IMT when ROI is set
- Support CCA, ICA, ECA, Bulb IMT
- Near wall and far wall detection
- Angle selectable
- IMT trend analysis

#### IVF

- The uterus and follicle growth curve can be displayed in the IVF report.
- Data of IVF history exams can be checked in the IVF report.

#### 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
- Better get GA before start auto 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

- 1T hard drive and 128G SSD (used to install OS and Doppler software)
- Up to 905 GB internal hard drive for patient data storage
- Capable of storing up to approximate 858000 single frames
- Direct digital storage of single frame and cine 2D, color and Doppler

#### 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 images as (BMP/JPG/TIFF/DCM/AVI/MP4 format )
- Support backup/send to USB devices, DVD-RW media

### Performance Specifications

#### iWorks™ (option)

- Auto workflow protocol
- Templates are user-configurable
- Functions
- iWorks setup mode
- iWorks setup annotation
- iWorks setup bodymark
- iWorks setup measurement
- Template import and export are available

#### Connectivity

##### Ethernet Network Connection

- Cable connection
- Wireless connection

#### DICOM 3.0

- DICOM basic
- Verify (SCU, SCP)
- Print
- Store
- Storage Commitment
- Media Exchange
- DICOM Worklist (HL7 supported)
- DICOM Query/Retrieve
- DICOM Modality Performed
- Procedure Step - MPPS
- DICOM OB/GYN structured report
- DICOM Abdomen structured report
- DICOM Cardiac structured report
- DICOM Vascular structured report
- DICOM Breast structured Report

#### iStorage (included in UltraAssist)

- 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 Wi-Fi.
- Support both IOS and Android-powered system
- For IOS powered smart device: DICOM is mandatory, IOS 5.0 or above; for Android-powered smart device: DICOM not necessary, Android 4.0 or above.

#### MedTouch

- Connect Ultrasound machine to smart devices, such as tablet PC or mobile phone. Remote control of Ultrasound machine, review of patient information, and tutorial software iScanHelper study on smart devices.
- Support IOS and Android powered smart devices

- Android 4.0 or above
- DICOM not necessary

#### Transducers

##### Curved array

- SC6-1E (Single Crystal)
  - Application: Gynecology, Obstetrics, Abdomen, Musculoskeletal, Vascular, Urology, Nerve
  - Bandwidth: 1.3 - 5.7 MHz
  - Convex Radius: 61.76 mm
  - Physical Footprint: 65.1 mm × 16.4 mm
  - Biopsy Guide: NGB-022, multi-angle, reusable

##### C11-3E

- Application: Abdomen, Transcranial
- Bandwidth: 2.6 - 12.8 MHz
- Convex Radius: 16.06 mm
- Physical Footprint: 32.8 mm × 25 mm
- Biopsy Guide: NGB-018, multi-angle, reusable

##### Endocavity

###### V11-3HE

- Application: Gynecology, Obstetrics, Urology
- Bandwidth: 2.6 - 12.8 MHz
- Convex Radius: 12.06 mm
- Physical Footprint: 24.9 mm × 21.8 mm
- Biopsy Guide: NGB-025, single angle, reusable

##### Volume Curved Array

###### SD8-1E (Single Crystal)

- Application: Gynecology, Obstetrics, Abdomen
- Bandwidth: 2.6 - 8.2 MHz
- Convex Radius: 45 mm
- Physical Footprint: 75.7 mm × 52.6 mm
- Biopsy Guide: NGB-039, multi-angle, reusable

###### DE11-3E

- Application: Gynecology, Obstetrics, Urology
- Bandwidth: 2.6 - 12.8 MHz
- Convex Radius: 12.06 mm
- Physical Footprint: 24.9 mm × 21.8 mm
- Biopsy Guide: NGB-027, single angle, reusable

##### Linear

###### L12-3E (ComboWave)

- Application: Musculoskeletal, Nerve, Small Parts, Vascular, Pediatric, Abdomen
- Bandwidth: 4.4 - 13.5 MHz
- Field of View (max): 38.1 mm
- Physical Footprint: 45.7 mm × 10.9 mm
- Biopsy Guide: NGB-007, multi-angle, reusable

##### L14-5WE

- Application: Musculoskeletal, Nerve, Abdomen, Pediatric, Vascular, Small Parts
- Bandwidth: 4.0-14.0 MHz (-20db)
- Number of Elements: 192
- Width (max): 5.44 cm
- Extended FOV: 20°
- Steer Angle:
  - B: +/-6°, +/-12°;
  - C/PW: +/-10°, +/-20°, +/-30°
- Depth: 1.5-28 cm
- Physical Footprint: 66 mm × 23 mm
- Aperture: 58.5 mm × 6 mm
- B-mode Frequencies: 4.0-9.6, 4.8 - 10.0, 6.0-12.6 MHz
- Harmonic Frequencies: 8.0, 10.0, 12.0 MHz
- Color Frequencies: 6.2, 7.3, 8.0, 8.0 (HR Flow) MHz
- PW Frequencies: 5.0, 6.2, 7.3 MHz
- Biopsy Guide: NGB-035, reusable

##### L9-3E (ComboWave)

- Application: Abdomen, Pediatric, Small Parts, Musculoskeletal, Vascular, Nerve, Obstetrics
- Bandwidth: 1.8 - 9.8 MHz
- Field of View (max): 43.7 mm
- Physical Footprint: 62 mm × 22 mm
- Biopsy Guide: NGB-034, multi-angle, reusable

##### L20-5E (ComboWave)

- Application: Abdomen, Small Parts, Musculoskeletal, Vascular, Nerve
- Bandwidth: 6 - 23 MHz
- Field of View (max): 28.5 cm
- Physical Footprint: 42.23 mm × 22.10 mm
- Biopsy Guide: not available

##### Phased Array

###### SP5-1E (Single Crystal)

- Application: Cardiac, Transcranial, Abdomen
- Bandwidth: 1.0 - 5.0 MHz
- Field of View (max): 90 °
- Physical Footprint: 38.2 mm × 30.5 mm
- Biopsy Guide: NGB-011, multi-angle, reusable

###### P7-3E

- Application: Abdomen, Pediatric, Cardiac, Transcranial, Nerve
- Bandwidth: 2.3 - 7.2 MHz
- Field of View (max): 90°
- Physical Footprint: 34 mm × 24.5 mm
- Biopsy Guide: not available

## Performance Specifications

### Data Security

Support encrypt patient data saved in the local hard disk

Two encryption methods can be selected:

Factory or User Define

Support encrypt backup data, with user defined password

Support LDAP login authentication, with different level user permissions

Add coding security mechanism, the account would be locked if the password incorrectly typed in several times consecutively

Support encrypt DICOM data, add TLS encryption preset

Support delete patient data with one button

Support anonymously send or backup patient data

If there is no operation within specific time, the screen will be locked automatically

Add security log

### Peripheral Devices and Accessories (Option)

#### Black/White Digital Video Printer

SONY UP-D898MD

MITSUBISHI P95DW-N

#### Black/White Analog Video Printer

MITSUBISHI P93W-Z

SONY UP-X898MD

#### Color Digital Printer

SONY UP-D25MD

#### Graph/Text Printer

HP Officejet Pro 8100

#### Gel Warmer

Easily be disassembled off system for cleaning

Temperature: 37° C, 40° C, off

Light indicator: Green--- working normally; Flickering orange---working abnormally

#### Footswitch

USB port: FS-81-SP-2 (1-pedal)

USB port: 971-SWNOM (2-pedal)

USB port: 971-SWNOM (3-pedal)

Support User-definable functions (such as: Freeze, Save, Print)

### ECG

6-pin, AHA/IEC, for 3-lead wires

ECG wave display: on/off

Gain: 0 - 30, 1/step

Sweep speed: 20 - 145 mm/s

### Barcode Reader

Laser barcode scanner

Model: SYMBOL LS2208 (1D), SYMBOL DS4308 (2D)

### Built-in Battery

Replaceable and rechargeable lithium battery

Restore from

standby mode: less than 12s

Full battery lasts more than 24h in standby mode

Light indicator for standby mode

Empty battery recharged to full in less than 4h

Continuous working

time of the main unit

powered by the

battery: no less than 75 mins.

### System Inputs and Outputs

#### Video/Audio Input

Microphone: 1 port

#### Video/Audio Output

S-Video out: 1 port, PAL/NTSC

HDMI: 1 port

VGA out: 1 port

Audio out: 1 port

#### Physio Input

Support ECG/PCG signal

Support Respiratory Wave

ECG: 1 port

#### Other Input/Output

USB: 5 USB 3.0 ports, 1 more dedicated USB port for printer

Ethernet: 1 port

### 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

#### 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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