DC-N3

Color Doppler Ultrasound System

Datasheet

Release 1.0

mindray

healthcare within reach

1 System Overview

1.1 Application

- Abdomen
- Obstetrics
- Gynecology
- Small parts
- Vascular
- Urology
- Musculoskeletal
- Orthopedics
- Emergency Medicine
- Nerve
- Cardiology
- Trans-cranial
- Pediatrics
- Others

1.2 Transducer types

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

1.3 Imaging modes

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

1.4 Standard features

- B-Mode
- THI and PSH
- M-Mode
- Color M-mode
- Color Doppler Imaging
- Power Doppler Imaging and Directional PDI
- Pulsed Wave Doppler
- HPRF (High Pulse Repeat Frequency)
- iClear™ (Speckle Suppression Imaging)
- iBeam™ (Spatial Compounding Imaging)
- iTouch™ (Auto Optimization)
- Zoom/iZoom™ (Full Screen Zoom)
- FCI (Frequency Compounding Imaging)
- B steer
- ExFOV Imaging
- iStation™
- iVision™
- Integrated 320G hard drive
- 3 active probe ports
- DVD RW Driver
- 5 USB ports
- Share Service Application Package (Abdominal, Obstetrical, Gynecological, Cardiac, Small Parts, Urological, Vascular, Pediatric Packages)
- Auto Doppler Calculation
- UltraAssist tool
  - iStorage (Direct Network Storage)
  - iMeasurement (User-Defined Measurement & Calculation tool off line)
  - iReport (User-Defined Report Template tool off line)
- On-line e-Manual

1.5 Optional features

- High density probe port
- Continuous Wave Doppler
- Free Xros M (Anatomical M-mode)
- Free Xros CM (Curved Anatomical M-mode)
- iScape™ View
- IMT (Auto Intima-Media Thickness Evaluation)
- Smart OB (Auto OB measurement)
- Smart 3D
- 3D/4D (Static 3D, Real time 4D)
- iPage™ (Multislice mode, for 4D and Static 3D)
- TDI (TVI, TEI, TVD, TVM)
- TDI QA (Quantitative Analysis)
- Built-in Battery: LI23I002A
- ECG module

- iRoam (Wireless Network Adapter)
- Footswitch: 971-SWNOM, SP-997-350
- Bar Code reader
- Nerve Application Package
- Emergency Medicine Application Package
- DICOM Basic (including DICOM Task Management, Storage, Print, Storage Commitment, Media Storage)
- DICOM Worklist
- DICOM MPPS (Modality Performed Procedure Step)
- DICOM OB/GYN structured report
- DICOM Vascular structured report
- DICOM Cardiac structured report
- DICOM Query/Retrieve

1.6 Language support

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

2 Physical Specification

2.1 Dimension and weight

- Width: 500mm
- Height: 1415-1275mm
- Depth: 690-740mm (when the height from max. to min.)
- Weight: approx. 62kg (Without options)

2.2 Monitor

- 15-inch high resolution color LCD monitor
- Resolution: 1024×768
- Brightness adjustable
- Screen saver
- Monitor: tilt of 20°up, 90°down, and swivel of 90° right, 90° left

2.3 Probe port

- 4 port connectors

2.4 Electrical power

- AC adapter Input:
  - Voltage:100-240V~
  - Frequency: 50/60Hz
  - Power consumption: 600VA
- Built-in Battery: Lithium-ion Battery 14.8V, 6600mAh

2.5 Operating Environment

- Ambient temperature: 0-40 °C (10-40°C only for D6-2 & D6-2A probe)
- Relative humidity: 30%-85% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

2.6 Storage & Transportation Environment

- Ambient temperature: -20~55 °C, -10~60 °C (only for D6-2 probe)
- Relative humidity: 30%-95% (no condensation)
- Atmospheric pressure: 700hPa-1060hPa

3 User Interface

3.1 Control panel

- Power/Battery indicator
- Alphanumeric keys
- Function keys
- Knobs
- Soft key operation
- Backlight keys, ensuring accurate work in the dark room
- 8-segment TGC control
- Programmable keys, available for user-defined functions
- Trackball, sensitivity adjustment
- Key brightness adjustment
- Integrated speakers, audio volume adjustment
- Independent rotation and up/down of control panel
  - Rotate: ±45° (from center)
  - Down/Up: 775-915mm (140mm range)

3.2 System boot-up

- Boot-up in about 33 sec
- Shut down in about 17sec

- Boot-up from standby mode in about 8 sec
- Shut down from standby mode in about 6 sec

3.3 Comments
- Support text input and arrow
- Adjustable text size, arrow size and direction
- Support home position
- Covers various application
- User customizable

3.4 Bodymark
- More than 140 bodymarks for versatile application
- User customizable

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

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

4 Imaging Parameters

4.1 Overview
- Echo-enriched Beamformer
- Up to1536 channels
- 4-beam forming

4.2 B-mode
- Display formats: Single(B), Dual(B+B), Quad(4B)
- iClear™: Off; On, 1-4 steps
- iBeam™: Off/On
- iTouch™: Auto optimization (TGC, Gain)
- Frequency (depend on probe)
- B steer: available on linear transducers
- ExFOV: extended FOV available on convex, linear and volume transducers
- Depth: 0.9-38.8cm (depend on transducer)
- Frame rate (max): 400f/s
- Acoustic output power: 7%-100%
- TGC: 8 pods on control panel
- Dynamic range: 30-240, 5/step
- Gain: 0-100, 1-2/step
- Focus number: 1-4, adjustable
- Focus position: Max. 16, adjustable
- FOV (Field of View): continuously adjustable
- Line density: L/M/H/UH
- Persistence: 0-7, 8 steps
- Horizontal Scale: on/off
- L/R flip: Left/Right
- U/D flip: Up/Down
- Rotation: 0°, 90°, 180°, 270°
- TSI (Tissue Specific Imaging): general/muscle/fluid/fat
- Gray Map: 8 types
- Tint map: off; 16 types

4.3 THI and PSH
- Available on all types of transducers
- Patent PSH technology, obtains purer harmonic, better contrast resolution
- iClear™ available

4.4 M-mode
- Display formats: V2:3, V3:2, V3:1, H2:3, Full (V: vertical, H: horizontal)
- Color M-mode available
- Acoustic output power: 7%-100%
- Dynamic range: 30-240, 5/step
- Gain: 0-100, 1-2/step
- Speed: 1-6, 6 steps
- M soften: 0-14, 1/step
- Tint map: off; 16 types
- Gray Map: 8 types
- Edge enhance: 0-3, 1/step

4.5 Free Xros M (option)
- Display formats: V2:3, V3:2, V3:1, H2:3,

(V: vertical, H: horizontal)
- Color Free Xros M available
- Up to 3 lines
- Acoustic output power: 7%-100%
- Gain: 0-100, 1-2/step
- Speed: 1-6, 6 steps
- Tint map: off; 16 types
- Gray Map: 8 types

4.6 Free Xros CM (option)
- Display formats: V2:3, V3:2, V3:1, H2:3, (V: vertical, H: horizontal)
- Acoustic output power: 7%-100%
- Gain: 0-100, 1-2/step
- Speed: 1-6, 6 steps
- Tint map: off; 16 types
- Gray Map: 8 types

4.7 Color Doppler Imaging
- Dual live
- iTouch™: Auto optimization (Gain)
- Frequency (depend on probe)
- Max. velocity: 199.9cm/s
- Steer: max. 20° (linear transducer)
- Max. frame rate: 268f/s
- Acoustic output power: 7%-100%
- Gain: 0-100, 2/step
- ROI size/position: adjustable
- Scale: 30 steps (depend on exam mode)
- Baseline: -8~+8, 17 steps
- Wall filter: 0-7, 8 steps
- PRF: max. 7.8kHz
- Packet size: 0-3, 4 steps
- Velocity tag: on/off
- Smooth: 0-4, 5 steps
- B/C Align: on/off
- Priority: 0%-100%, 10%/step
- Map: V0-V10, VV0-VV9, 21 types
- Invert: on/off
- Persistence: 0-4, 5 steps
- Line density: L/M/H/UH, 4 steps

4.8 Power Doppler Imaging
- Dual live
- Support directional PDI
- Frequency (depend on probe)
- Acoustic output power: 7%-100%
- Dynamic range: 10-70, 5/step
- Gain: 0-100, 2/step
- ROI size/position: adjustable
- Steer: max. 20° (linear transducers)
- Scale: 30 steps (depend on exam mode)
- Wall filter: 0-7, 8 steps
- PRF: Max. 7.8kHz
- Packet size: 0-3, 4 steps
- Smooth: 0-4, 5 steps
- B/C Align: on/off
- Priority: 0%-100%, 10%/step
- Map: P0-P3, dP0-dP3, 8 types
- Persistence: 0-4, 5 steps
- Line density: L/M/H/UH, 4 steps

4.9 PW/CW-Mode
- Display formats: V2:3, V3:2, V3:1, H2:3, Full (V: vertical, H: horizontal)
- iTouch™: Auto optimization (Baseline, PRF)
- Frequency (depend on probe)
- PW velocity: max. 924.0cm/s
- CW velocity: max. 6160cm/s
- Sample volume size: 0.5-20mm (PW only), 0.5-5mm/step
- Sample gate depth: adjustable
- Scale: 30 steps
- Baseline: -4~4, 9 steps
- PW Steer: max. 20° (linear transducer)
- Audio: 0%-100%, 2%/step
- PW PRF: max. 24kHz
- Gain: 0-100, 2/step
- Dynamic range: 24-72, 2/step
- Speed: 1-6, 6 steps
- Wall filter: 0-6, 7 steps
- Invert: on/off
- Angle: -89°~89°, 1/step
- Quick angle: 0°, -60°, 60°
- Gray map: 8 types
- Tint map: Off; 16 types
- Time/frequency resolution: 0-4, 5 steps
- Auto calc: on/off
- Trace area: above, below, all
- HPRF: on/off

4.10 Tissue Velocity/Energy Imaging (included in TDI option)
- Available on phased array transducer
- Dual live: side by side displays B and B+TVI

- Max velocity: 199.9cm/s
- Max. frame rate: 429f/s
- PRF: max. 6.1kHz
- Acoustic output power: 7%-100%
- Gain: 0-100, 2/step
- Dynamic range: 10-70, 5/step (TEI only)
- ROI size/position: adjustable
- Scale: 30 steps
- Baseline: -8~8, 17 steps (TVI only)
- Wall filter: 0-7, 8 steps
- Packet size: 0-3, 4 steps
- Velocity tag: on/off
- Smooth: 0-4, 5 steps
- B/C Align: on/off
- Priority: 0%-100%, 10%/step
- Map: 10 types
- Invert: on/off (TVI only)
- Persistence: 0-4, 5 steps
- Line density: L/M/H/UH, 4 steps

4.11 Tissue Velocity Doppler (included in TDI option)

- Available on phased array transducer
- Display formats: V2:3, V3:2, V3:1, H2:3, Full (V: vertical, H: horizontal)
- Max velocity: 924.0 cm/s
- Sample volume size: 0.5-20mm
- Sample gate depth: adjustable
- Scale: 30 steps
- Baseline: -4~4, 9 steps
- Audio: 0%-100%, 2%/step
- PRF: max. 24.0kHz
- Gain: 0-100, 2/step
- Dynamic range: 24-72, 2/step
- Speed: 1-6, 6 steps
- Wall filter: 0-6, 7 steps
- Invert: on/off
- Angle correction: -89°~89°, 1/step
- Quick angle: 0°, -60°, 60°
- Gray map: 8 types
- Tint map: Off; 16 types
- Time/frequency resolution: 0-4, 5 steps

4.12 Tissue Velocity Motion (included in TDI option)

- Display formats: V2:3, V3:2, V3:1, H2:3, Full (V: vertical, H: horizontal)
- Acoustic output power: 7%-100%
- Dynamic range: 30-240, 5/step
- Gain: 0-100, 1-2/step
- Speed: 1-6, 6 steps
- M soften: 0-14, 1/step
- Gray Map: 8 types
- Edge enhance: 0-3, 1/step

4.13 Smart 3D (option)

- Smart 3D™
  - Display formats: Single, Dual, Quad, A4:1
  - Reset: Reset All, Reset curve, Reset orientation
  - Quick Rotation: 0°, 90°, 180°, 270°
  - Render type: Gray, Invert
  - Accept VOI: on/off
  - VOI: on/off
  - Render: Surface, Max, Min, X-ray
  - Direct: D/U, U/D, L/R, R/L, F/B, B/F (D: down, U: up, L: left, R: right, F: front, B: back)
  - Threshold: 0%-100%, 1%/step
  - Opacity: 0%-100%, 5%/step
  - Smooth: 0-20, 21 steps
  - Bright: 0%-100%, 2%/step
  - Contrast: 0%-100%, 2%/step
  - Tint: off; 8 types
  - Current window: VR, A, B, C
  - MPR/VR: MPR, VR
  - iClear: Off; On,1-4 steps
  - Slice
  - Flip
  - Sync
  - MPR only: off/on
- Edit
  - Rotation control: X, Y, Z axis
  - Tool: inside polygon, outside polygon; inside contour, outside contour; inside rect, outside rect
  - Other operations: undo, undo all

4.14 4D (option)

- Available on volume transducer
- Static 3D and 4D
  - 4D frame rate: max. 30 vps
  - Display formats: Single, Dual, Quad, A4:1
  - Reset: Reset ALL, Reset curve, Reset

orientation
- Quick Rotation: 0°, 90°, 180°, 270°
- Render type: Gray, Invert
- Accept VOI: on/off
- VOI: on/off
- Render: Surface, Max, Min, X-ray
- Direct: D/U, U/D, L/R, R/L, F/B, B/F (D: down, U: up, L: left, R: right, F: front, B: back)
- Threshold: 0%-100%, 1%/step
- Transparency: 0%-100%, 5 %/step
- Smooth: 0-20, 21 steps
- Brightness: 0%-100%, 2%/step
- Contrast: 0%-100%, 2%/step
- Tint: off; 8 types
- Current window: VR, A, B, C
- MPR/VR: MPR, VR
- iClear: Off; On,1-4 steps
- Slice
- Flip
- Sync
- MPR only: off/on

• iPage
- Slices number: 3-16
- Spacing: 0.5-10mm
- Line Direction: V/H
- Ref. Plane: A, B, C
- Display format: 2×2, 3×3, 4×4, 5×5
- Adjust Slice
- Range Position
- Slice Position
- Ref. Image: on/off
- Reset Orientation

• Edit
- Rotation control: X, Y, Z axis
- Tool: inside polygon, outside polygon; inside contour, outside contour; inside rect, outside rect
- Other operations: undo, undo all

4.15 iScape™ View (option)
- Panoramic imaging
- Available on all transducers
- Acquisition method: B mode
- Imaging length: 120cm
- Tint map: off; 16 types
- Rotation: 0°~355°

4.16 Zoom
- iZoom™
  - Full screen zoom
  - Normal image, Zoom standard area, Zoom image area, 3 steps
- Spot zoom (write zoom) 0.8-10x
- Pan zoom (read zoom) 0.8-10x

4.17 TDI QA (option)
- Dedicated quantification tool for TDI velocity analysis
- Freehand ROI: manually deploy ROI on the cine
- Up to 8 ROIs
- ROI tracking: on/off
- Std.Height: 1.5-50 mm
- Std.Width: 1.5-50 mm
- Std.Angle: -89°~90°
- Export: export current data as a CSV format file

5 Cine Review and Post Processing

5.1 Cine review
- Available in all modes
- Frame by frame manual cineloop review or auto playback with variable speed
- Independent cine review in 2D Dual and Quad mode one by one
- Maximum cine memory is up to 12392 frames and PW mode up to 169.6s
- Maximum 4D cine memory is around 271 volumes
- Retrospective storage (1-120s, or 1-120 cycles, pre-settable) and prospective storage (1-480s, or 1-120cycles, pre-settable)
- Frame compare: compare different frames for one cine in dual format
- Cine compare: compare two or more than two cines in dual or quad format
- Jump to first and jump to last: one keystroke review the first or last frame
- Start point and end point: selectable

5.2 Post Processing
- B-mode:
  Zoom
  Gray map

Tint map
Flip
Rotation

- M-mode:
  Gray map
  Tint map
- Color/Power:
  Invert
  Baseline
  Map
  Priority
  Smooth
- PW/CW:
  Gain
  Baseline
  Angle correction
  Quick angle
  Invert
  Gray map
  Tint map

6 Measurement/Analysis and Report*

6.1 Generic measurements

- 2D-mode
  - Depth
  - Distance
  - Area: Ellipse, Trace, Spline, Cross
  - Trace Length
  - Double Distance
  - Parallel
  - Volume: 3-Distance, Ellipse, Ellipse + Distance)
  - Length Ratio
  - Area Ratio
  - IMT
  - B Histogram
  - B Profile
  - Volume Flow
  - Color Velocity
- M-mode
  - Distance
  - Time
  - Slope
  - Heart Rate
  - Velocity
- Doppler mode
  - D Velocity
  - Time
  - Heart Rate
  - Acceleration
  - D Trace
  - PS/ED
  - Volume Flow
- Automatic Doppler Spectrum Analysis
  - Heart cycle pre-settable (1, 2, 3, 4, 5)
  - Automatic tracing in real-time
  - User configurable display of items
  - Support PI, RI, TAMAX, TAMEAN, Volume Flow calculations
  - Appropriate factory setting according to applications

6.2 Clinical option measurement package

- Abdominal
  - Liver
  - Common Hepatic Duct
  - Portal Vein Diameter
  - Gall Bladder: Length, Height, Wall Thickness
  - Common Bile Duct
  - Pancreas: Head, Body, Tail, Duct
  - Spleen
  - Left/Right Kidney: Length, Width, Height, Volume, Cortical Thickness
  - Left/Right Adrenal Gland: Length, Width, Height
  - Abdominal Aorta Diameter
  - Abdominal Aorta Bifurcate Diameter
  - Iliac Diameter
  - Bladder: Length, Width, Height, Volume, micturition volume
  - Common Hepatic Artery
  - Hepatic Artery
  - Portal Vein, Main Portal Vein
  - Hepatic Vein, Left Hepatic Vein, Middle Hepatic Vein, Right Hepatic Vein
  - Splenic Artery
  - Splenic Vein
  - Left/Right Renal Artery, Main Renal Artery, Renal Artery Origin, Arcuate Artery, Segmental Artery, Interlobar Artery, Renal Vein

- Abdominal Aorta
- Celiac Axis
- Superior Mesenteric Artery
- Inferior Vena Cava
- Superior Mesenteric Vein

- Gynecology
  - Cervix: Length, Height, Width
  - Uterus: Length, Width, Height, Volume, Uterus body, Endometrium Thickness
  - UT-L/CX-L
  - Ovary: Length, Width, Height, Volume
  - Follicle: Length, Width, Height, Average Diameter, Volume
- Obstetrics
  - Early OB: GS, YS, CRL, BPD, FL, NT, Amniotic Fluid
  - 2nd- 3rd Trimester: BPD, HC, OFD, FL, AC, AF, NF, PL Thickness, TAD, APAD, TCD, Cisterna Magna, HW, OOD, IOD, Orbit, HUM, Ulna, RAD, Tibia, FIB, CLAV, Vertebrae, MP, Foot, Ear, APTD, TTD, FTA, THD, HrtC, TC, Umb VD, F-Kidney, Mat Kidney, Cervix L, Facial Angle
  - Fetal Heart: LVIDd, LVIDs, LV Diam, LA Diam, RVIDd, RVIDs, RV Diam, RA Diam, IVSd, IVSs, IVS, LV Area, RV Area, RA Area, Ao Diam, MPA Diam, LVOT Diam, RVOT Diam,
  - Gestational Age
  - Amniotic Fluid Index
  - Fetal Growth
  - Fetal Trend Graph
  - Estimated Fetal Weight
  - Multi-gestational Calculations
  - Fetal Biophysical Profile
  - User definable OB tables
  - Z-score
- Cardiology
  - LV Function: Teichholz, Cube, Gibson, Simpson Single-plane, Simpson Bi-plane, Modified Simpson, Bullet, S-P Ellipse, B-P Ellipse
  - Auto LV: auto measurement in Simpson method
  - LV Mass: Area-Length Method, Truncated-Ellipsoid Method, Cube Method
  - Atrial Volume: LA Vol(A-L), LA Vol(Simpson), RA Vol(Simpson)
  - LVIMP
  - LV TEI, RV TEI
  - Qp/Qs
  - PISA MR, AR, TR, PR
  - MVA(VTI), AVA(VTI)
  - MV medial/lateral (TDI)
- Urology
  - Prostate: Length, Width, Height, Volume
  - PPSA, PSAD
  - Ureter Diameter
  - Bladder: Length, Width, Height, Volume, micturition volume
  - Left/Right Kidney: Length, Width, Height, Volume, Cortical Thickness
  - Left/Right Adrenal Gland: Length, Width, Height
  - Left/Right Testis: Length, Width, Height
  - Left/Right Seminal Vesicle: Length, Width, Height
- Vascular
  - Carotid: CCA, ECA, ICA, Bulb, Vert A, Subclav A
  - Upper Extremity Artery: Subclav A, Axill A, Brachial A, Radial A, Ulnar A, Innom A
  - Upper Extremity Vein: Cephalic V, Basilic V, Ulnar V, Radial V
  - Lower Extremity Artery: CFA, SFA, Pop A, TP Trunk A, Peroneal A, P.TIb A, A.Tib A, Dors. Ped A,
  - Lower Extremity Vein: C.Iliac V, Ex.Iliac V, Femoral V, Saph V, Pop V, TP Trunk V, Sural V, Soleal V, Peroneal V, P.Tib V, A.Tib V
  - TCD (Transcranial Doppler): ACA, MCA, PCA, Basilar, A Comb.A, P Comb.A, Vertebral A, Basilar A
- Small Parts
  - Thyroid: Length, Height, Width, Volume
  - Isthmus Height

- Testis: Length, Height, Width
- Mass: Length, Height, Width, Nip. Distance, Skin Distance
- Superior Thyroid Artery
- Inferior Thyroid Artery

• Orthopedics
- Hip
- d/D

6.3 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

6.4 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
- Initiating AC should input GA first
- Measurement result can be modified by user

6.5 Report
- Specific report template to the application
- Editable value in report
- Images are selectable
- Titles are pre-settable in setup
- Export as PDF/RTF format

6.6 Off-line measurement and report templates user-defined tools (included in UltraAssist tool)
- iMeasurement
  - Measurement and calculation user-defined tool off line
- iReport
  - Report templates user-defined tool off line

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

7 Exam Storage and Management

7.1 Exam storage
- 320GB hard drive. About 270GB internal hard drive reserved for patient data storage
- Capable of storage up to approximately 89,822 single frames (FRM format)
- Storage area
  - Pre-settable: image area, standard area, full-screen
  - Image area: 640*480
  - Standard area: 800*600
  - Full-screen: 1024*768

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

8 Connectivity

8.1 Ethernet Network Connection
- Wired connection
- Wireless connection: built-in wireless adapter (option)

8.2 DICOM 3.0
- DICOM Basic (option)
  - Task management
  - Print
  - Storage
  - Storage Commitment
  - Media Exchange
- DICOM Worklist (option)
- DICOM Modality Performed Procedure Step - MPPS (option)
- DICOM OB/GYN structure report (option)
- DICOM Cardiac structure report (option)

- DICOM Vascular structure report (option)
- DICOM Query/Retrieve (option)

8.3 iStorage(included in UltraAssist tool)

- Direct network storage tool between ultrasound system and personal computer

9 Probes

9.1 Curve array

- 3C5A
  - Application: Adult Abdomen, Gynecology, Obstetrics, Vascular, Pediatric Abdomen
  - Bandwidth: 2.5-5.2MHz(-6dB); 1.7-6.0MHz(-20dB)
  - Center Frequency: 3.5MHz
  - Number of Elements: 128
  - FOV (max): 70°
  - ExFOV: 90°
  - Convex Radius: 50mm
  - Physical Footprint: 76mm× 29.5mm
  - Footprint: 62mm × 16mm
  - B-mode Frequencies: 2.0, 3.5, 4.5, 5.0 MHz
  - Harmonic Frequencies: 5.0, 6.0MHz
  - Doppler Frequencies: 2.5, 3.0MHz
  - Biopsy Guide: available, multi angle, reusable
- 6C2
  - Application: Pediatric Abdomen, Pediatric Cardiac, TCI, Nerve
  - Bandwidth: 4.6-9.3MHz(-6dB); 3.3-11.3MHz(-20dB)
  - Center Frequency: 6.5MHz
  - Number of Elements: 128
  - FOV (max): 100°
  - ExFOV: 120°
  - Convex Radius: 15mm
  - Physical Footprint: 33.5mm×24.8mm
  - Footprint: 29mm× 10mm
  - B-mode Frequencies: 5.0, 6.5, 7.5, 8.5 MHz
  - Harmonic Frequencies: 8.0, 9.0MHz
  - Doppler Frequencies: 4.4, 5.0MHz
  - Biopsy Guide: available, multi angle, reusable
- V10-4
  - Application: Gynecology, Obstetrics, Urology
  - Bandwidth: 4.7-9.0MHz(-6dB); 3.4-11.0MHz(-20dB)
  - Center Frequency: 6.5MHz
  - Number of Elements: 128
  - FOV (max): 160°
  - ExFOV: 180°
  - Convex Radius: 10mm
  - Physical Footprint: 22.1mm×21.5mm
  - Footprint: 22.1mm×9.1mm
  - B-mode Frequencies: 5.0, 6.5, 7.5, 8.5MHz
  - Harmonic Frequencies: 8.0, 9.0 MHz
  - Doppler Frequencies: 4.0, 5.0 MHz
  - Biopsy Guide: available, single angle, reusable
- V10-4B
  - Application: Gynecology, Obstetrics, Urology
  - Bandwidth: 4.7-9MHz(-6dB); 3.4-11.0MHz(-20dB)
  - Center Frequency: 6.5MHz
  - Number of Elements: 128
  - FOV (max): 160°
  - ExFOV: 180°
  - Convex Radius: 10mm
  - Physical Footprint: 22.1mm×21.5mm
  - Footprint: 22.1mm×9.1mm
  - B-mode Frequencies: 5.0, 6.5, 7.5, 8.5MHz
  - Harmonic Frequencies: 8.0, 9.0 MHz
  - Doppler Frequencies: 4.0, 5.0 MHz
  - Biopsy Guide: available, single angle, reusable

9.2 Linear array

- 7L4A
  - Application: Small parts, Vascular , Musculoskeletal, Pediatric Abdomen, Nerve
  - Bandwidth: 5-11.7MHz (-6dB); 3.7-13.1MHz (-20dB)
  - Center Frequency: 7.5MHz
  - Number of Elements: 128

- Field of View (max): 38mm
- Steered Angle: +/-6°(B), +/-12°(Color, PW)
- Physical Footprint: 45.7mm×10.9mm
- Footprint: 43mm×10mm
- B-mode Frequencies: 5.0, 7.5, 8.5, 10.0MHz
- Harmonic Frequencies: 8.0, 10.0MHz
- Doppler Frequencies: 5.0, 5.7MHz
- Biopsy Guide: available, multi angle, reusable

- L12-4
  - Application: Small parts, Vascular , Musculoskeletal, Pediatric Abdomen, Nerve
  - Bandwidth: 4.5-10.0MHz (-6dB); 3.0-13.0MHz (-20dB)
  - Center Frequency: 7.5MHz
  - Number of Elements: 192
  - Field of View (max): 38mm
  - Steered Angle: +/-6°(B), +/-12°(Color, PW)
  - Physical Footprint: 45.7mm×10.9mm
  - Footprint: 43mm×10mm
  - B-mode Frequencies: 5.0, 7.5, 8.5, 10.0MHz
  - Harmonic Frequencies: 8.0, 10.0MHz
  - Doppler Frequencies: 5.0, 5.7MHz
  - Biopsy Guide: available, multi angle, reusable
- L14-6
  - Application: Small parts, Vascular, Musculoskeletal, Pediatric Abdomen, Nerve
  - Bandwidth: 5.1-12.5MHz (-6dB); 3.5-16.0MHz (-20dB)
  - Center Frequency: 10MHz
  - Number of Elements: 128
  - Field of View (max): 26mm
  - Steered Angle: +/-6°(B), +/-20°(Color, PW)
  - Physical Footprint: 31.6mm×22.8mm
  - Footprint: 30mm× 8mm
  - B-mode Frequencies: 8.0, 10.0, 12.0, 14.0MHz
  - Harmonic Frequencies: 12.0, 14.0MHz
  - Doppler Frequencies: 5.7, 6.6MHz
  - Biopsy Guide: available, multi angle, reusable

9.3 Phased array

- 2P2
  - Application: Adult Cardiac, Pediatric Cardiac, TCI, Adult Abdomen
  - Bandwidth: 2-4.1MHz (-6dB); 1.5-5.0(-20dB)
  - Center Frequency: 2.5MHz
  - Number of Elements: 64
  - Field of View (max): 90°
  - Physical Footprint: 25.2mm×20.6mm
  - Footprint: 23mm×15mm
  - B-mode Frequencies: 2.0, 2.5, 3.0, 3.5MHz
  - Harmonic Frequencies: 3.2, 3.6MHz
  - Doppler Frequencies: 2.0, 2.3MHz
  - CW Frequency: 2.0MHz
  - Biopsy Guide: available, multi angle, reusable

9.4 Volume curved array

- D6-2
  - Application: Gynecology, Obstetrics, Abdomen
  - Bandwidth: 2.6-5.5MHz(-6dB); 1.6-6.2(-20dB)
  - Center Frequency: 4.5MHz
  - Number of Elements: 128
  - FOV (max): 70°(B)× 70°(sweep)
  - Convex Radius: 40mm
  - Physical Footprint: 66.36mm ×44.99mm
  - Footprint: 66.36mm×44.99mm
  - B-mode Frequencies: 2.5, 3.5, 4.5, 5.5MHz
  - Harmonic Frequencies: 5.0, 6.0MHz
  - Doppler Frequencies: 2.5, 3.0MHz
  - Biopsy Guide: not available
- D6-2A
  - Application: Gynecology, Obstetrics, Abdomen
  - Bandwidth: 2.6-5.5MHz(-6dB); 1.6-6.2MHz(-20dB)
  - Number of Elements: 128
  - FOV (max): 80°(B) × 70°(sweep)

- Convex Radius: 40mm
- Physical Footprint: 79.2mm×56mm
- Footprint: 64mm×47.2mm
- B-mode Frequencies: 2.5, 3.5, 4.5, 5.5MHz
- Harmonic Frequencies: 5.0, 6.0MHz
- Doppler Frequencies: 2.5, 3.0MHz
- Biopsy Guide: not available

10 Peripheral Devices and Accessories (Option)

10.1 Analog Black/white video printer
- SONY UP-897MD
- MITSUBISHI P93W-Z

10.2 Analog Color video printer
- SONY UP-20
- MITSUBISHI CP910E

10.3 Digital Black and White Video Printer
- SONY D897

10.4 Graph/text printer
- HP LaserJet p1007
- HP LaserJet 1020 plus

10.5 Footswitch
- USB port: FS-81-SP (1-pedal)
- USB port: 971-SWNOM (2-pedal)
- USB port: SP-997-350 (3-pedal)
- Support User-definable functions (Freeze, Save, Print)

10.6 ECG module
- ECG lead port: 6 pin, IEC&AHA

10.7 Built-in Battery
- Model: LI23I002A
- Replaceable and rechargeable lithium battery
- Continuous work time: about 1h in B mode
- Full battery lasts about 24h in standby mode
- Empty battery recharged to full in less than 8h

10.8 Built-in DVD R/W
- USB DVD R/W drive

10.9 Barcode reader
- 1-D barcode reader: SYMBOL LS2208-SR

10.10 Built-in wireless adapter
- Encryption: WEP, WPA-PSK, WPA2-PSK
- Transfer speed: Max. 300Mbps
- Protocol: 802.11b, 802.11g, 802.11n

11 System Inputs and Outputs

11.1 Video/Audio output
- Video out: 1 port
- Audio out: 2 ports
- S-Video out: 1 port
- DVI: 1 port
- VGA out: 1 port

11.2 Video/Audio Input
- Audio in: 2 ports
- ECG in: 1 port

11.3 Other input/output
- USB: 5 ports
- Ethernet: 1 port
- Remote control: 1 port

12 Safety and Conformance

12.1 Quality standards
- ISO 9001:2008
- ISO 13485:2003

12.2 Design standards
- EN 60601-1 and IEC 60601-1
- EN 60601-1-2 and IEC 60601-1-2
- EN 60601-2-37 and IEC60601-2-37
- EN ISO 14971 and ISO 14971
- EN ISO10993-1 and ISO10993-1
- EN 62366 and IEC 62366
- EN 62304 and IEC 62304
- EN 1041
- EN 980
- IEC 60878

12.3 CE declaration

DC-N3 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 code of the EU-notified body that certified meeting the requirements of Annex II of the Directive.

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