

Specifications for S40 Color Doppler Ultrasound System



SonoScape

THE PIONEER OF DOPPLER ULTRASOUND IN CHINA

Product Overview

1. General Specification

The S40 Color Doppler Ultrasound System adopts the advanced ultrasonic Doppler technologies, including the Full Digital Super-wide Band Beam Former, Digital Dynamic Focusing, Variable Aperture and Dynamic Tracing, Wide Band Dynamic Range, Multi-Beam Parallel Processing, etc. The ultrasound diagnostic software system, ultrasound system imaging, multi-languages operation interfaces and touch screen with human-computer interaction technology can be customized easily in accordance with the design of human engineering. Users can perform the system with the minimum requirement of training or guidance. This system has been designed to comply with applicable international standards and regulations, ensuring the safety and availability of this product.

This system is based on the computer technology and Linux operation system, which make the system more flexible and stable. System maintenance and function update can be completed by software updating, through which would promote product value and keep the technological advancement.

2. Advanced Technologies

- New generation digital front-end technology
- Multi-beam processing technology
- Spatial compound imaging

- Post-processing technology
- Tissue harmonic imaging
- High pulse repetition frequency
- Panoramic imaging
- 4D imaging
- Graphic diagnosis icon
- Touch screen with human-computer interaction technology
- Keyboard lifting system

3. Standard Configurations

- B mode
- Color mode
- PW mode
- CW mode
- THI mode
- TDI mode
- DPI mode
- DDPI mode
- 3D imaging
- Cardiology measurement package
- Gynecology measurement package
- Urology measurement package
- Vascular measurement package
- Small parts measurement package
- Orthopedic measurement package
- IMT measurement
- TEI index
- Spectral Doppler auto trace
- Color flow volume measurement
- MLA probe
- Phased array probe

- Multi-beam processing technology
- μ -scan function
- TDI function
- B mode: Five variable frequencies
- High pulse repetition frequency
- Triplex mode
- Panoramic imaging
- Compound imaging
- Trapezoid imaging
- DVD RW burner
- ECG function module

4. Optional Functions

- Steer M mode
- Color M mode
- 4D imaging
- TEE probe
- Image rotation function
- B Flow function
- DICOM transmission
- DICOM storage commitment
- DICOM worklist function
- MPPS

5. Optional Accessories

- Biopsy bracket
- Color ink-jet printer
- B/W video printer
- Color video printer
- Probe cable hanger

6. Probe Scan Ranges

- Convex array transducer: $\geq 70^\circ$
- Phased array transducer: $\geq 90^\circ$
- Micro-convex array transducer: $\geq 193^\circ$

7. Scan Methods

- Electronic curved sector scan
- Electronic linear array scan
- Electronic phased array sector scan

8. Applications

- Abdomen
- Vascular
- Cardiology
- Gynecological/Obstetrical
- Urology
- Musculoskeletal
- Interventional ultrasound
- Small parts
- Anesthesiology
- Pediatrics

9. Imaging Modes

- B mode
- M mode
- THI mode
- CDI mode
- DPI mode
- TDI mode
- PW mode
- CW mode

- 3D/4D mode
- Color M mode
- Steer M mode

10. Display Formats

- Dual B
- Quad B
- B + PW
- B + CW
- B + M
- B + Color
- Dual B (Flow)
- B + Color + PW
- B + Color + CW
- B + Color M
- Panoramic imaging
- Trapezoidal imaging

11. System Configuration

Menu

- Exam History
 - New Exam
 - Pause/Continue
 - Review
 - Select All
 - Store to DICOM
 - Store to USB
 - Delete
 - Print
 - Report
 - Exit

- Delete
- Store
- DICOM Print
- Commit
- Exit
- System Settings
 - General Settings
 - Facility Name
 - Set Date/time
 - Language
 - ⊕ English
 - ⊕ Simplified Chinese
 - Screen Saver
 - Trackball Sensitive
 - Clip Format
 - ⊕ MP4, AVI
 - Still Format
 - ⊕ JPG, BMP
 - Screen Save: adjustable
 - Color of ROI
 - ⊕ Green, Yellow
 - ⊕ Orange, Cyan
 - Display Format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
 - One Key Save: On/Off
 - EFW Unit: selectable
 - Date Format
 - ⊕ mm /dd/yyyy
 - ⊕ yyyy/mm/dd
 - ⊕ dd/mm/yyyy
 - Report Format
 - ⊕ PDF, TEXT

- Monitor Type
 - ⊕ TV-PAL
 - ⊕ TV-NTSC
 - ⊕ VGA
- Save Frame Number: adjustable
- Set Printer
 - Printer Driver
 - Video Invert
 - Insert Driver
- Set Calculation Menu
 - 2D Mode
 - ⊕ Angle
 - ⊕ Volume
 - ⊕ Volume L×W×H
 - ⊕ Doppler Area
 - ⊕ Color Flow
 - ⊕ IMT
 - ⊕ Vascular
 - ⊕ Small Part
 - ⊕ Orthopedic
 - ⊕ Obstetrical/Gynecological
 - ⊕ Left Ventricle
 - ⊕ Urologic
 - ⊕ Mitral Valve Diameter
 - ⊕ Lv Outflow Diameter
 - ⊕ Pul.Valve Diameter
 - ⊕ Aorta Diameter
 - PW Mode
 - ⊕ Flow Velocity
 - ⊕ Acceleration
 - ⊕ Time
 - ⊕ Heart Rate
- ⊕ Cardiac
- ⊕ Obstetrical/Gynecological
- ⊕ Vascular
- M Mode
 - ⊕ Distance
 - ⊕ Time
 - ⊕ Slope
 - ⊕ Heart Rate
 - ⊕ Left Ventricle
 - ⊕ Mitral Valve
 - ⊕ Aortic Valve
- Set Measurement Method
 - BSA setting
 - ⊕ Eastern
 - ⊕ Western
 - Area Measure Method
 - ⊕ Ellipse
 - ⊕ Trace
 - Package
 - ⊕ All Packages
 - Continue Dist: On/Off
 - Dop Auto
 - ⊕ AUTO
 - ⊕ SEMI-AUTO
 - Focal Auto: On/Off
 - EFW Method
 - ⊕ WEI/SAB HC, AC, FL
 - ⊕ Shepard AC, BPD
 - ⊕ Hadlock1 AC, FL
 - ⊕ Hansman AC, FL, HC
 - ⊕ Tokyo BPD, APTD, TTD, FL
 - ⊕ Hadlock2 HC, AC, FL

⊕ Hadlock3	BPD, AC, FL	⊕ Nelson
⊕ Hadlock4	HC, AC	⊕ Jeanty
⊕ Hadlock5	BPD, HC, AC, FL	⊕ Hansmann
⊕ Shinozuka	BPD, AC, FL	⊕ Mediscan
⊕ Warsof	FL,AC	⊕ Tokyo
⊕ Campbell	AC	⊕ Osaka
⊕ Mediscan	FL, AC	➤ AC Method
⊕ Mediscan	BPD, AC	⊕ Hadlock
➤ BPD Method		⊕ Hansmann
⊕ Hadlock		⊕ Tokyo
⊕ Jeanty		⊕ Merz
⊕ Crespigeny		⊕ Campbell
⊕ Kurtz		➤ TAD Method
⊕ Hansmann		⊕ Hansmann
⊕ Sabbagha		➤ OFD Method
⊕ Campbell		⊕ Hansmann
⊕ Tokyo		➤ HC Method
⊕ Merz		⊕ Hadlock
⊕ Osaka		⊕ Jeanty
➤ FL Method		⊕ Chitty (M)
⊕ Hadlock		⊕ Chitty (D)
⊕ Hohler		⊕ Merz
⊕ Jeanty		⊕ Campbell
⊕ Hansmann		➤ GS Method
⊕ Tokyo		⊕ Nyberg
⊕ Merz		⊕ Hansmann
⊕ Chitty		⊕ Hellman
⊕ Osaka		⊕ Tokyo
⊕ Campbell		⊕ China
➤ CRL Method		➤ Fibula Method
⊕ Robinson		⊕ Merz
⊕ Hadlock		➤ Radius Method

- ⊕ Merz
- ⊕ Mediscan
- Humerus Method
 - ⊕ Jeanty
 - ⊕ Merz
 - ⊕ Osaka
- Ulna Method
 - ⊕ Jeanty
 - ⊕ Merz
 - ⊕ Mediscan
- Tibia Method
 - ⊕ Jeanty
 - ⊕ Merz
- AUA Result by
 - ⊕ Average
 - ⊕ Last
- User defined OB Method
 - ⊕ Replace
 - ⊕ Save
 - ⊕ Cancel
- Annotation Edit
 - Insert
 - Delete
 - Edit
 - Save
- Define Quick Key (0-9)
 - OB measurement
 - Cardiac measurement
- Load Default
 - Load
 - Create
 - Retrieve

- ⊕ Copy user setting to USB
- ⊕ Copy user preset to USB
- ⊕ Load USB user setting to system
- ⊕ Load USB user preset to system
- DICOM Settings
 - Local
 - Store
 - Worklist
 - Print
 - MPPS
 - Commit
- System Info
 - Control Number
 - Software Version

12. System Parameters

- Frame rate: ≥ 750 fps
- Grayscale Level: 256
- Transducer Elements: 256

13. B Mode

- Gain: 1-255 adjustable
- Scan Depth: 32.4cm
- Image Zoom, Showing zoom ratio
- TGC: 8 levels slider controls
- Image Inversion: Left and Right, Up and Down
- Panoramic imaging: achievable
- Compound imaging: adjustable
- Focus: Up to 12, Focus span adjustable

- Frequency: 5 bands adjustable
- Chroma: 13 types selectable
- Adaptive image fusion: 15 types selectable
- μ -Scan: adjustable
- Line Density: 3 levels adjustable (High/Medium/Low)
- Persistence: 0-95 selectable
- Biopsy Guide Function: On/Off
 - Biopsy lines angle adjustable
 - Biopsy lines offset adjustable
- Dynamic Range: 20-280 (Probe dependent)
- Grayscale Curve: 7 selectable
- Imaging width and position: adjustable
- Power: 1-100 adjustable, one step each
- Tissue Acoustic: 1400-1700
- Trapezoid Imaging: On/Off (Linear array probe)
- B steer Mode (Linear array probe)

14. Color/TDI

- Gain: 0-255
- Frame Rate: ≥ 50 frames/sec
- Size and position of color ROI: adjustable
- Auto Focus (focus number:1)
- Inversion: Up/Down, Left/Right
- Flow Invert: On/Off
- Frequency Range: 5 steps, adjustable
- Wall Filter: 25-750Hz, adjustable
- PRF: 0.5-12kHz (Probe dependent)
- Line Density: 4 kinds

(low/medium/high/max-high)

- Color/Direction energy: 11 kinds, selectable
- Color baseline adjustment: ± 15 steps
- Persistence: 0-80 (Probe dependent)
- B Reject: 0-255
- Linear deflection angel: 0, ± 16 , ± 20 adjustable

15. M Mode

- Steer M: 3 sample lines, Display frame rate
- Video Inversion (On/Off)
- Chroma: 5 types
- Display Format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
- Scan Speed: 6 levels adjustable
- M Processing: Switch between average and peak values
- Power: 30-100 adjustable

16. PW/CW Mode

- Doppler Methods
 - PW (pulsed wave) Doppler
 - CW (continuous wave) Doppler
- 2D Refresh: On/Off
- Sample Volume and Position for PW Doppler: 1-20mm adjustable
- Video Inversion: On/Off
- Spectrum Inversion: Achievable
- θ Angle Correction: On/Off (correction range: 0 - $\pm 72^\circ$)

- Spectral Real-time Trace: Achievable
- Baseline Shift: 17 steps selectable
- Frequency Range: 5 steps
- Wall Filter: 25-750 adjustable
- PRF: 1~16kHz (PW)
- PRF: 1-48KHz (CW)
- Max Velocity Range:
 - 0.0007-18.2 m/s (PW)
 - 0.0012-61.4 m/s (CW)
- Scan Speed: 2, 4, 6, 8 sec/plane
- Doppler Chroma: 5 kinds selectable
- One-key Auto Optimization
 - Auto Adjusting Baseline
 - Auto Adjusting PRF
 - Auto Correcting Angle
- Dynamic Range: 10 types selectable
- Display Format: H1/2, H1/4, V1/3, V1/2, V2/3, O1/4
- Deflection Angle: 0, ± 16 , ± 20 , 5 levels adjustable

17.3D Mode

- Display Mode:
 - Dual Planes
 - Quad Planes
 - 3D Full Display
- Clip Plane: On/Off
- ROI Mode
- Hide ROI
- Crop: In, Out, Off
- X Rotation
- Y Rotation

- Z Rotation
- Horizontal Movement: Left/Right
- Vertical Movement: Up/Down
- Trace Cut: Off/In/Out
- Undo Cut
- Render Mode: Vol, MaxIP, X ray
- Auto Rotate: 45°, 90°, 180°, 270° and 360°, selectable
- Zoom In/Out: adjustable
- Threshold: 0-255 adjustable
- Scan Mode: Lin and Sec, selectable
- Z Scale: 0.1-2.0 adjustable
- Z Axis Angle: 10°-170° adjustable
- Color Map: 0-4 selectable
- Multi-Slice: Ref A, Ref B, Ref C
- Slice Spacing: 0.5-2.0, adjustable
- 3D Image/Volume Storage
- Measurement: Distance, Area, Ellipse
- Print Function

18.4D Mode

- Display Mode:
 - Dual Planes
 - Quad Planes
 - 3D Full Display
 - 2D Full Display
- Cutting Line Curvature and position: adjustable
- Copy Frame Size and Position: adjustable
- 4D Image Gain: Adjustable
- Frame Rate: 5 f/s

- Clip Plane: On/Off
- Volume Playback: 0-31 adjustable
- Rescan: On/Off
- Stability: On/Off
- ROI Mode
- Hide ROI
- Crop: In, Out, Off
- X Rotation
- Y Rotation
- Z Rotation
- Horizontal Movement: Left/Right
- Vertical Movement: Up/Down
- Trace Cut: Off/In/Out
- Undo Cut
- Render Mode: Vol, MaxIP, X ray
- Auto Rotate: 45°, 90°, 180°, 270° and 360°, selectable
- Zoom In/Out: adjustable
- Threshold: 0-255 adjustable
- Scan Angle: 20°-75° adjustable
- Image Quality: High, Medium, Low
- Color Map: 0-4 selectable
- Multi-Slice: Ref A, Ref B, Ref C
- Slice Spacing: 0.5-2.0, adjustable
- Measurement: Distance, Area, Ellipse
- Storage: 3D Image/Cine/Volume Storage

19. Physiological Signal

Display

- ECG Pulse wave
- ECG Lead-three lead system
- ECG Gain: adjustable

- ECG Position: adjustable
- ECG Invert: On/Off
- R-Trigger: On/Off
 - Trigger Delay: adjustable
 - Frame Count: adjustable

20. Integrated Data

Management System

- Digital Channel: 1024
- Hard Disk Memory Capacity: More than 320G
- USB Interface: 4

21. Image Storage and

Playback

- Cine Loop: Up to 500 frames in B mode
- Cine Loop Time: 50 seconds or more
- Static and Dynamic image storage
- The Stored Images can be viewed directly on PC.
- Clip Board Function
- Doppler Cine Playback: Speed is adjustable; Sound can be played back.

22. DICOM Network

Communication

- Storage: Directly transmits images with patient information to a DICOM file server
- Storage Commitment: Confirm with the server whether the image/cine are stored safely.

- Worklist: Acquire patient information from the server.
- MPPS: Send patient exam status to the server.
- Print: Images can be printed directly using a DICOM compatible printer
- Medical digital images and communication DICOM 3.0 interface

23. Preset Function

Users can customize the presets based on different probe and diagnostic part to optimize imaging parameters and adjustment combination.

24. Patient Data Management

- Patient Registration: Name, ID, Gender, Date of Birth, Height, Weight, LMP, EDD and GA.
- Patient Data, Report, Images can be searched, played back and printed

25. Annotation and Body Mark Setting

- Body Mark Icon: More than 52 kinds
- Annotation can be selected in the library.

Annotation Number: Up to 20

26. Physical Specification

- L×W×H(mm): 997×684×1517
- Weight: Approx. 150Kg

27. Probe Connectors

- Common Probe Connectors: Total 5 connectors
- Pencil probe connector:1

28. Monitor

- 19" Widescreen and High-Resolution Color LCD monitor, anti-flickering and vertically and horizontally rotatable
- Contrast and brightness: 0-100, adjustable

29. Safety Standard

Comply with IEC60601-1, Class I , BF international standard

30. Environmental Requirements

- Operation Environment
 - Temperature:+10°C to +40°C (Except VC6-2)
 - Relative Humidity: 30% to 85% (Non condensing)
 - Atmospheric pressure: 700 to 1060hPa
- Transportation and Storage Environment
 - Temperature: -20°C to +55°C
 - Relative humidity: 20%- 90% (non condensing)

- Atmospheric Pressure: 700 to 1060hPa
- **Power Supply**
 - 110/220VAC, 5.0Amps
 - Frequency: 50/60Hz

31. Optional Transducers

- Phased Array Probe (Cardiology)
 - 2P2 (1.0-5.0MHz)
 - 3P1 (1.0-5.0MHz)
 - 5P2 (3.0-8.0MHz)
 - 8P1 (4.0-12.0MHz)
- Linear Probe (Vascular, Small Parts)
 - L741 (5.0-10.0MHz)
 - L742 (5.0-12.0MHz)
 - L752 (5.0-12.0MHz)
- Convex Probe (Abdomen, OB/GYN)
 - C344 (2.0-5.0MHz)
 - C353 (2.0-6.0MHz)
 - C322 (2.0-6.0MHz)
- Micro-convex Probe (Trans-vaginal)
 - 6V1 (4.0-8.0MHz)
 - 6V3 (5.0-9.0MHz)
- Volume Probe (Fetus)
 - VC6-2 (2.0-6.0MHz)

32. Measurement/ Calculation and Report

- **General measurements**
 - B Mode
 - Distance (Real time/Freeze)

- Angle
- Volume (L×W×H, Ellipse Area × L)
- Area and circumference (Trace, Ellipse methods) (real time/freeze)
- M Mode
 - Distance
 - Speed
 - Time
 - Heart rate
 - Slope
- Spectral Doppler
 - Time
 - Heart rate
 - Speed
 - Speed ratio
 - Acceleration
 - Resistivity index
 - Pulsatility index
 - Peak velocity
 - Pressure gradient
 - Manual trace
 - Auto-trace
 - Velocity-time integration
 - Average pressure
 - End diastole velocity
 - Pressure half-time
 - Average flow velocity
- Color Doppler
 - Color Flow Velocity
 - Doppler Area
 - Proximal Isovelocity surface area
- 4D Mode

- Distance
 - Area and circumference
 - Volume
 - **OB/GYN Measurements**
 - B Mode
 - GS
 - CRL
 - BPD
 - HC
 - AC
 - FL
 - CER
 - OFD
 - Fibula
 - Foot
 - AA
 - APAD
 - HA
 - Humerus
 - Kidney
 - APTD
 - OOD
 - Radius
 - TAD
 - TC
 - THD
 - Tibia
 - TTD
 - Ulna
 - Umb VD
 - NT
 - PW Mode
 - Umb A
 - MCA
 - Rt Uterine A
 - Lt Uterine A
 - Fetal AO
 - **Cardiology Measurement and Calculation**
 - B Mode
 - Left ventricle measurement
 - ⊕ Single ellipse method
 - ✓ End diastole left ventricle
- LV
 - UT L
 - UT H
 - UT W
 - Cx
 - En-T
 - Rt OV L
 - Rt OV H
 - Rt OV W
 - Lt OV L
 - Lt OV H
 - Lt OV W
 - AFI
 - Follicle
 - EFA
 - EDD
 - EFW
 - AUA
 - GA

long-axis area	✓ End diastole left ventricle short-axis area at the level of mitral valve
✓ End diastole left ventricle long-axis length	✓ End systole left ventricle short-axis area at the level of mitral valve
✓ End systole left ventricle long-axis area	✓ End diastole left ventricle short-axis area at the level of papillary muscles
✓ End systole left ventricle long-axis length	✓ End systole left ventricle short-axis area at the level of papillary muscles
⊕ Biplane ellipse method	✓ End diastole left ventricle long-axis length
✓ End diastole left ventricle long-axis area	✓ End systole left ventricle long-axis length
✓ End systole left ventricle long-axis area	⊕ Cube
✓ End diastole left ventricle short-axis area at the level of mitral valve	✓ End diastole inter ventricular septum dimension
✓ End systole left ventricle short-axis area at the level of mitral valve	✓ End diastole left ventricle short-axis length
✓ End diastole left ventricle short-axis length	✓ End diastole left ventricular posterior wall dimension
✓ End systole left ventricle short-axis length	✓ End systole inter ventricular septum dimension
⊕ Bullet method	✓ End systole left ventricle short-axis length
✓ End diastole left ventricle short-axis area at the level of mitral valve	✓ End systole left ventricle posterior wall dimension
✓ End systole left ventricle short-axis area at the level of mitral valve	⊕ Teichholz
✓ End diastole left ventricle long-axis length	✓ End diastole left ventricle short-axis length
✓ End systole left ventricle long-axis length	✓ End systole left ventricle short-axis length
⊕ Simpson	⊕ Gibson

- | | |
|---|--|
| <ul style="list-style-type: none"> ✓ End diastole left ventricle short-axis length ✓ End systole left ventricle short-axis length ⊕ Biplane Disk <ul style="list-style-type: none"> ✓ Diastole 2CH ✓ Diastole 4CH ✓ Systole 2CH ✓ Systole 4CH ➤ Mitral valve diameter ➤ Left ventricle out flow tract diameter ➤ Pulmonary valve diameter ➤ Aorta valve diameter ■ M Mode <ul style="list-style-type: none"> ➤ Left ventricle <ul style="list-style-type: none"> ⊕ Cube <ul style="list-style-type: none"> ✓ End diastole left ventricle short-axis length ✓ End systole left ventricle short-axis length ✓ End diastole left ventricular posterior wall dimension ✓ End systole left ventricle posterior wall dimension ⊕ Gibson <ul style="list-style-type: none"> ✓ End diastole left ventricle short-axis length ✓ End systole left ventricle short-axis length ⊕ Teichholz <ul style="list-style-type: none"> ✓ End diastole left ventricle short-axis length | <ul style="list-style-type: none"> ✓ End systole left ventricle short-axis length ➤ Mitral valve measurement ➤ Aortic valve measurement ■ PW Mode <ul style="list-style-type: none"> ➤ Mitral valve measurement ➤ Aortic valve measurement ➤ Tricuspid valve measurement ➤ Pulmonary valve measurement ➤ TEI Index Measurement ● Vascular measurements <ul style="list-style-type: none"> ■ ICA ■ ECA ■ CCA ■ INT IL ■ EXT IL ■ ILIAC ■ CFA ■ PROFUN ■ LT CIR ■ SFA ■ POP ■ PTA ■ PERON ■ ATA ■ DR PED ■ %A REDUC ■ %D REDUC ■ PI ■ RI ■ VTI |
|---|--|

- S/D
- Pg
- PV
- IMT
- **Urology measurements**
 - Left kidney measurement
 - Right kidney measurement
 - Left renal cortex
 - Right renal cortex
 - Left adrenal gland measurement
 - Right adrenal gland measurement
 - Bladder volume
 - Residue urine measurement
 - Bladder area
 - Bladder height
 - Prostate whole volume
 - Left seminal vesicle measurement
 - Right seminal vesicle measurement
 - Left testicle measurement
 - Right testicle measurement
 - Prostate transition zone volume
- **Small parts measurements**
 - Left thyroid
 - Right thyroid
 - Thyroid isthmus
 - Left upper parathyroid glands
 - Left lower parathyroid glands
 - Right upper parathyroid glands
 - Right lower parathyroid glands
- **Orthopedic measurements**
 - HIP
- **Report**
 - Obstetrical /Gynecological report (Editable)
 - Obstetrical Curve: 4 planes
 - Fetal Anatomy
 - Fetal Biophysical Evaluation
 - Fetal Compare (Quadruplets)
 - Image Insertion: 6 planes
 - Annotation
 - Cardiac function report (Editable)
 - Vascular report
 - Urological report
 - Small Part report
 - IMT report

NOTE:

- The specifications of this system may change without any prior notification.
- Some products or features may not be available in some countries.
- Please contact your local SonoScape sales representative for more information.