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| Title | X3 Technical Specifications |
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# Specification of X3 Digital Color Doppler Ultrasound System

SonoScape

SonoScape Medical Corp

## 1. General Specification

The X3 system adopts advanced ultrasonic Doppler technologies, Full Digital Super-wide Band Beam Former, Digital Dynamic Focusing, Variable Aperture and Dynamic Tracing, Wide Band Dynamic Range, Multi-Beam Parallel Processing, etc., and is equipped with ergonomic design and customizable multi-language graphic interface, which provide users intuitive operation of the system with minimum degree of training or guidance and enhance the diagnostic experience in clinic. The X3 is designed to comply with applicable international standards and regulations, ensuring the safety and availability of this product.

The operation system of X3 is developed based on embedded computer technology and Linux operation system, which ensure the flexibility and stability of system. The software upgrades are provided for product maintenance updates and functional upgrades, which maintain the technological advancement and enhance product value.

## 2. Advanced Technologies

- New generation digital front-end technology
- Multi-beam processing technology
- Spatial compound imaging
- μScan image processing technology
- Tissue harmonic imaging (THI)
- Pure inversion harmonic imaging (PHI)
- Graphic diagnosis icon

## 3. Standard Configurations

- μScan function
- 5-band adjustable frequency in B mode
- Tissue specification imaging (TSI)
- THI mode
- PHI mode
- Multi beams
- B steer
- Spatial compound imaging
- Widescan (Trapezoid imaging)
- Image rotation
- Color flow mode (CFM)
- Power Doppler imaging (PDI) mode
- Directional PDI (DPDI) mode
- Pulse wave (PW) Doppler mode
- Continuous wave (CW) Doppler mode
- Simult mode
- Basic measurement package
- Obstetrics measurement package
- Gynecology measurement package
- Cardiology measurement package
- Abdomen measurement package
- Vascular measurement package
- Urology measurement package
- Small parts measurement package
- Pediatrics measurement package
- TEI index
- PW auto trace
- DICOM Store
- DICOM Send

## 4. Optional Accessories

- Biopsy bracket
- Color ink-jet printer

- B/W video printer
- Footswitch
- Trolley
- Backpack
- Transducer extender
- I/O Docking extender
- Solid state disk

## 5. Scan Methods

- Electronic curved array
- Electronic linear array
- Electronic phased array

## 6. Applications

- Abdomen
- Cardiac (neonatal and adult)
- Obstetrics/Gynecology
- Urology
- Small Organ (breast, testicle, thyroid)
- Musculo-skeletal (conventional and superficial)
- Peripheral Vascular
- Pediatrics
- Cephalic (neonatal, adult)
- Trans-rectum
- Trans-vagina

## 7. Imaging Modes

- B mode
- M mode
- THI mode
- PHI mode
- CFM mode
- PDI mode
- DPDI mode
- PW mode
- CW mode

## 8. Display Formats

- B + B
- 4B
- B + CFM
- B + PDI
- B + M
- B + PW
- B + CFM + PW
- B + PDI + PW
- B + CW
- B + CFM + CW
- B + PDI + CW
- Widescan

## 9. System Settings Menu

- General
  - General
    - Hospital Name
    - Freeze Response
      - Cine
      - Annotation
      - Body Mark
      - Arrow
    - End Exam Response
      - Scan
      - New Patient
      - Freeze
    - Trackball Sensitivity
      - 1, 2, 3, 4, 5

- Language
  - English
  - Chinese
- Time Zone Setting
- Date/Time Setting
- Date Format
  - YYYY/MM/DD, MM/DD/YYYY, DD/MM/YYYY
- Time Format
  - 12, 24

- Display
  - Screen Saver
    - On, Off
  - Screen Save Wait Time (in Min)
    - 5, 10, 15, 20, 30, 40, 50, 60
  - Width Ruler
    - On, Off
  - Key Volume
    - 0, 1, 2, 3
  - Trackball Color
    - Ivory, acid blue, green, purple, light yellow, pink, Off
  - Keyboard Brightness
    - Auto (On, Off)
    - Manual (0-100)
  - Monitor
    - Brightness (0-100)
    - Colors (Warm, Cold)
  - Clear Annotation on UnFreeze
    - On, Off

- Save
  - Save Format/Area
    - Area (Full Screen, Image Area, Image Area+ Info Bar)
    - Cine (WMV, AVI)
    - Image (JPG, BMP, TIF)
  - Key Function
    - P1, P2, F3, F4 (None, Save Image, Save Cine, Screen Shot, Print Image)
  - Save Sound
    - High, Low, None

- Exam Preset
  - Probe
  - Available Items
  - Selected Items
  - Add Items
  - Move/Delete Items

- Measure
  - General
    - BSA (Body surface area: Eastern, Western)
    - Keep Result Window (On, Off)
  - Formula
    - Fetal Weight
      - Estimation
      - EFW (Estimated Fetal Weight): GP (Growth Percentage)/SD (Standard Deviation)
      - Age by EFW
      - Unit
    - GA (Gestational Age)/Growth
      - AC (Abdominal Circumference)

- APAD (Anterio-Posterial Abdominal Diameter)
- Cereb (Cerebella)
- CM (Cisterna Magna)
- CRL (Crown-Rump Length)
- Clav. (Clavicle Length)
- FIB (Fibula Length)
- FL (Femoral Length)
- GS (Gestational Sac Diameter)
- HC (Head Circumference)
- HL (Humerus Length)
- NBL (Nasal Bone Length)
- OFD (Occipital-Frontal Diameter)
- OOD (Orbital Outer Diameter)
- RAD (Radius Length)
- TAD (Transverse Abdominal Diameter)
- TIB (Tibia Length)
- TTD (Transverse Trunk Diameter)
- Ulna (Ulna Length)

● Report

- Logo (Import/Export)
- Title/Font/Color
  - Title 1/2/3
  - Context
  - Title
  - Sub-title
  - Background Color
  - Text Color
- Display Items For Report
  - Patient Information
  - Exam Information
  - Measurements (optional)
  - Images (optional)
  - Graphs (optional)
  - Comment (optional)
  - Preview button

● Peripheral

- Basic
  - Video Output
    - Area (Picture Area, Info+ Picture Area, Full Screen)
    - CVBS/S-VIDEO (NTSC, PAL, ClOSE)
    - HDMI (CLOSE, 1920×1080)
  - Printer
    - Default Printer (HP Laser Jet Printer, HP Ink Jet Printer, Windows Printer)
    - Printer IP Address
    - Printer Port Number
  - Foot Switch
    - Left Key/Right Key (Save Image, Save Cine, Print Image, Freeze/Unfreeze)
- Network
  - Local Network (Enable, Disable)
    - IP Address (DHCP, Static IP)
    - Netmask
    - Default Gateway
    - Mac Address
    - Ping IP Address
  - Wireless Network

    - Wireless Network List (Enable/Disable)
    - Connect
    - Disconnect
    - Refresh
    - Advance
- DICOM
  - Store
    - Service List (Add/Delete)
    - DICOM Image Storage (Remote Hostname, IP Address, DICOM AE Title, Port Number; Connect Timeout, Dimse Timeout, Repeat Count, Acse Timeout)
- System Information

## 10. System Parameters

- Grayscale: 256
- Boot-up time: 22 seconds

## 11. B Mode

- Gain: 0-255 adjustable, 5 each step
- Depth: 30 cm (probe dependent)
- Image zoom, Showing magnification (0.8-10 times)
- TGC (Time Gain Compensation): 8-level slider control
- Image rotation: 0°, 90°, 180°, 270° selectable
- Steer: 0°, ±2°, ±4°, ±6° selectable
- Harmonic imaging: Off, PHI, THI (probe dependent) selectable
- Image flip: Left/Right, Up/Down
- Compound imaging: On/Off
- Focus: Position and area adjustable
- Frequency: 5 bands adjustable
- Chroma: 13 types selectable
- μScan: Off, 1, 2, 3, 4, 5 selectable
- Line density: 3 levels adjustable (high/med/low)
- Persist: Off, low, med, high, max selectable
- Dynamic range: 20-200 adjustable, 20 each step
- Gray map: 16 types selectable
- Sector width: 5 types adjustable
- Power: 1%-100% adjustable, 5% each step
- Widescan: On/Off
- TSI: 4 types selectable (adipose/muscle/fluid/normaltissue)
- Auto optimization function

## 12. Color Doppler Mode

- Gain: 0-255
- Size and position of ROI: Adjustable
- Auto focus (focus number: 1)
- Image flip: Up/Down, Left/Right
- Flow invert: On/Off
- Hide CFM: On/Off
- Power: 1%-100% adjustable
- Frequency range: 3 bands adjustable
- Wall filter: Min, low, med, high, max adjustable
- PRF: 0.5-10kHz (probe dependent)
- Line density: 3 levels (low/med/high)
- PDI/DPDI: 7 types selectable
- Color map: 5 types selectable
- Baseline: 9 levels adjustable
- Persist: Off, low, med, high, max selectable (probe dependent)
- B reject: 0-255

- Steer: 0, ±8°, ±12°, ±16° adjustable

## 13. M Mode

- Chroma: 13 types
- Display form: Full, H1/1, V1/2, V1/1,V2/1
- Sweep speed: 5 levels adjustable (min/slow/med/fast/max)
- Power: 1%-100% adjustable, 5% each step

## 14. Spectral Doppler Mode

- Doppler methods
  - PW Doppler
  - CW Doppler
- Mode: Inactivated mode 1, inactivated mode 2, activated mode
- Simult: On/Off (displayed in inactivated mode 2 or activated mode)
- Sample volume and position for PW Doppler: 0.5-24.5 mm adjustable
- Spectrum invert: Achievable
- Quick angle: 0°, 60°, -60°
- Angle correction range: -88°-88° adjustable, 2° each step
- Spectral real-time auto trace: On/Off
- Baseline shift: 9 steps selectable
- Frequency: 3 steps (5.0/5.7/6.7)
- Wall filter: Min, low, med, high, max adjustable
- PRF: 1-16 kHz (PW) (probe dependent)
- PRF: 1-50 kHz (CW) (probe dependent)
- Max velocity range
  - 0.01-21 m/s (PW) (probe dependent)
  - 0.01-42 m/s (CW) (probe dependent)
- Sweep speed: 5 levels adjustable (min/slow/med/fast/max)
- Chroma: 13 types, selectable
- Display form: FULL, H1/1, V1/2, V1/1, V2/1
- Steer: 0°, ±8°, ±12°, ±16° adjustable

## 15. Integrated Data Management System

- Hard disk memory capacity: 500 GB
- USB port: Two (four with transducer extender)

## 16. Image Storage and Playback

- Cine playback: Up to 1575 frames in B mode
- Static and dynamic image storage in the real-time single or dual display mode
- The stored images can be viewed directly on PC.
- Clipboard function
- Doppler cine playback: Speed is adjustable; Sound can be played back.

## 17. DICOM Network Communication

- Storage: Directly transmits images with patient information to a DICOM file server
- Medical digital images and communication DICOM 3.0 interface

## 18. Preset Function

- Users can customize the presets based on different probes and diagnostic parts to optimize imaging parameters and adjustment combination.
- Users can arrange the presets.

## 19. Patient Data Management

- Patient registration: Name, ID, Gender, Date of Birth, Height, Weight, LMP (Last Menstrual Period), EDD (Estimated Delivery Date) and GA.
- Patient data and reports are archived by patient exams.
- Reports and images can be previewed.
- Preview size can be set to 1×1 and 2×2.
- Previewed file can be selected, deleted or DICOM send.
- Data can be exported to USB drive in BMP, JPG, TIF, AVI or WMV format.

## 20. Annotation and Body Mark Setting

- Body marks can be classified by specific exams, abdomen, urology, small part, breast, gynecology, obstetrics, vascular, cardiology and MSK (musculoskeletal).
- Annotation can be selected from a word library, the preset one of which supports abdomen, urology, small part, breast, gynecology, obstetrics, vascular, cardiology and MSK application.

## 21. Physical Specification

- Size (L×W×D): 378mm×339 mm×60.5mm (including mat); 378mm×339 mm×56.5mm (without mat)
- Weight: Approx. 4.4kg (including battery)
  Approx. 3.89kg (without battery)
- Monitor: 15.6” Widescreen and High-Resolution Color LCD monitor, LED backlight, anti-flickering and swivel (with adjustable open angle 0°-180°)
- Probe port: 1, extendable

## 22. Safety Standard

- Comply with IEC60601-1, Class I BF,
- Comply with IEC60601-1-2, Group 1, Class B
- Comply with IEC60601-2-37

## 23. Environmental Requirements

- Operation Environment
  - Temperature: 0°C to +40°C
  - Relative Humidity: 30% to 85% (no condensation)
  - Atmospheric pressure: 700 to 1060hPa
- Transportation and Storage Environment
  - Temperature: -20°C to +55°C
  - Relative humidity: 20%- 90% (no condensation)
  - Atmospheric Pressure: 700 to 1060hPa
- Power Supply
  - 100-240V~, 1.5-0.75A
  - Frequency: 50/60Hz

## 24. Optional Probes

- Phased Array Probes
  - 3P-A (Frequency: 1.0-6.0MHz, sweep sector: 90°)
- Linear Probes
  - L741 (4.0-16.0MHz)
- Convex Probes
  - 3C-A (1.0-7.0MHz)
  - C613 (4.0-13.0MHz)
- Endocavity Convex Probe

- 6V1 (3.0-15.0MHz)

**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.

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