

1. System Overview

1.1. Application

- Abdomen
- Gynecology
- Obstetrics
- Cardiology
- Small parts
- Urology
- Vascular
- Pediatric

1.2. Transducer Types

- Convex array
- Linear array
- Phased array
- Endocavity curved array

1.3. Imaging Modes

- B-mode
- M-mode
- Color Doppler
- Power Doppler Imaging/Directional PDI
- Pulsed Wave Doppler
- Continuous Wave Doppler
- HPRF(High Pulse Repetition Frequency)

1.4. Imaging Technique&Function

- Frequency Compounding Imaging
- Spatial Compounding Imaging
- Harmonic Imaging
- Speckle Reduction Imaging (eSRI)
- Digital Multi-Beam Beamforming
- Pan Zoom
- Needle Guide

1.5. Display Modes

- B
- B+B
- 4B
- M
- B+M
- B/C

- B/ PDI
- B/ DPDI
- B+B/C
- B+B/PDI
- B+B/DPDI
- B+PW
- B/C+PW
- B/PDI+PW
- B/DPDI+PW
- B+CW
- B/C+CW
- B/PDI+CW
- B/DPDI+CW

1.6. System Language Support

- Software : English, Chinese, French, German, Italian, Spanish, Russian, Polish, Portuguese
- Keyboard input: English, Chinese, Russian
- Control panel overlay: English, Chinese
- User Manual: English, Chinese

1.7. Standard Features

- USB Disk (only for international marketing)
- coupling gel

1.8. Optional Features

- Transducers
- Printers
- Battery (only for international marketing)
- Hard disk
- Needle Guide Bracket Kit
- Mobile trolley
- Footswitch
- Hand carried bag
- Luxury Hand carried bag
- Probe cable holder
- Dustproof cloth
- DICOM 3.0
- External DVD

2. Physical Specification

2.1. System Architecture

- Physical Channels: 64

- System dynamic range: 0-166dB
- Beam forming: Dual beam
- Memory: 504MB
- Hard drive: 500GB(optional)
- Operation System: Linux

2.2. Dimension and weight

- Height: 32cm
- Width: 22cm
- Depth: 33cm
- Weight: 7.8kg(no probe and battery)

2.3. Monitor

- 12.1" TFT-LCD monitor
- Resolution: 1024 x 768
- Imaging field size: 640*512
- Video out size: 800 * 600
- Capture size: BMP, JPG, AVI, DCM 1024 * 768; FRM, CIN 640 * 512
- View angle: Up 80°, Down 80°, Left 80°, Right 80°
- Brightness and Color Temp adjustable
- Built-in stereo speaker

2.4. Transducer port and holder

- 2 active ports
- 2holders
- 1 Coupling holder

2.5. Electrical Power

- Voltage: 110V-240VAC
- Frequency: 50/60 Hz
- Power: 97.4w

2.6. Battery

- Rechargeable lithium ion battery
- Capacity: 5000mAh
- Removable
- Approximately 50 minutes of typical ultrasound exam use
- Max charging time:8 hours

2.7. Environmental operating requirements

- Ambient temperature: 5° to 40°C
- Relative Humidity: 25%~80% (no condensation)
- Atmospheric pressure: 86kPa-106kPa

2.8. Environmental storage requirements

- Ambient temperature: -20° to 55°C
- Relative Humidity: 25%~93% (no condensation)
- Atmospheric pressure: 70kPa-106kPa

3. User Interface

3.1. Control Panel

- Interactive back-lighting
- Hard Keys provides tactile feedback
- Physical trackball
- 8 segment TGC sliders
- Physical keyboard

3.2. System boot-up

- Boot up from complete shut-down in about45 sec
- Shut-down in about3 sec
- Recovery from screen saver in about 3 sec

3.3. Comments

- Arrow
- Block move and delete for separate blocks of text
- Support physical keyboard for text input
- 267user-defined comments in pre-defined presets
- 6 User customizable comments per a preset

3.4. BodyMark

- Up to 130 Body Mark graphics in library

3.5. Screen Information

- EDAN logo
- Hospital name
- Date
- Time
- Patient ID
- Patient Name
- Patient Gender
- Patient Age
- Transducermodel
- Preset name
- Mechanical index (MI)
- Thermal Index (TI)
- Imaging parameters

- Gray Scale bar
- Depth Scale

***Not all the items are listed in here, please refer to the User Manual.**

4. Imaging Parameters

4.1. B-Mode

- Image Type: Detail/Soft/HContrast/Penetration)
- Zoom: 7 levels, x1.44, x1.96, x2.56, x4.0, x5.76, x9.0, x16.0 (available on live state); 7 levels: x1.31, x1.78, x2.56, x4.0, x7.11, x10.24, x16.0 (available on freeze state)
- Depth: 1.9- 32.4cm
- Frequency: 2.0-15.0MHz(3 fundamental & 2 harmonic frequencies)
- eSRI: 0-8
- Rejection: 0-7
- Scan Angle: 0-3
- Gain: 0-130dB, 2dB/step
- TGC: 8 segments
- Dynamic range: 30-150 dB, 4dB/step
- Scan Mode: Hiden/HiFR
- Max Frame rate: 244 f/s
- Map: 0-14
- Frame Persist: 0-7
- Focus position: 0-15
- Focus Number: 1-4
- Pseudo color: 6 types
- H Reverse: On/Off
- V Reverse: On/Off
- 90° rotation: 0/1/2/3
- B/W Invert: On/Off
- Spatial compounding: on/off (max 3angles)
- Display format: single(B), dual(B+B), Quad(4B): B, 2B, 4B

4.2. M-Mode

- Sweep speed: 0-3
- Line Average: 0-7
- Gray Map : 0-14
- Pseudo Color: 6 types
- Gain: 0-130dB, 2dB/step

- Frequency: 2.0-15.0MHz(3 fundamental and 2 harmonic frequencies)
- Dynamic range: 30-150 dB, step 4dB/step
- B/M Display: U/D, L/R

4.3. Color Doppler

- Flow Type: HFlow/MFlow/LFlow
- Dual live (B/B+C)
- ROI size/position: adjustable
- ROI Color: Green, Yellow
- Frequency: 2.5-8.0 MHz
- Gain: 1-80dB, 1dB/step
- Max Frame rate: 38 f/s
- Persist: 0-7
- Smooth filter: 0-7
- Wall filter: 0-7
- Map: 0-7
- Angle Steer: 0°, ±10° (available for linear transducers)
- PRF: 16 levels 0.5- 11kHz
- Scale: 9-175 cm/s
- Baseline: 0-6
- Threshold: 0-15
- Invert: on/off
- Packet Size: 4 levels

4.4. Power Doppler Imaging

- Flow Type: H Flow/M Flow/L Flow
- Dual live (B/B+PDI)
- Directional Power Doppler Imaging(DPDI)
- ROI size/position: adjustable
- ROI Color: Green, Yellow
- Frequency: 2.5-8.0 MHz
- Gain: 1-80dB, 1dB/step
- Max Frame rate: 38 f/s
- Persist: 0-7
- Smooth filter: 0-7
- Wall filter: 0-7
- Map: 0-7
- Angle Steer: 0°, ±10° (available for linear transducers)
- Baseline: 0-6 (only available on DPDI)
- Threshold: 0-15
- Invert: on/off (available on DPDI)
- Packet Size: 4 levels

4.5. Pulsed Wave Doppler

- Flow Type: H Flow/M Flow/L Flow
- HPRF: On/Off(available for C5-2b, L15-7b and P5-1b)
- Duplex and Triplex displays
- Frequency: 2.5-8.0 MHz
- PRF: 16 levels 1-15kHz
- Gain: 1-80dB, 1dB/step
- Dynamic range: 30-90 dB, 2dB/step
- Wall filter: 0-3
- Sweep speed: 0(10.3s), 1(7.95s), 2(5.19s), 3(3.97s), 4(2.75s), 5(1.53s)
- Baseline: 0-6
- Correct Angle: -79° -79°, 1°/step
- Quick Angle: -79°/-60°/-30°/0°/30°/60°/79°
- Steer: 0°, ±10°(available on linear transducers)
- Invert: On/Off
- Volume: 0-7
- Pseudo color: 6 types
- Sample Volume: 16 levels, 0.5-20 mm

4.6. Continuous Wave Doppler

- Flow Type: H Flow/M Flow/L Flow
- Frequency: 2.0 MHz
- PRF: 0-32, 0.8-80KHz
- Gain: 1-80dB, 1dB/step
- Dynamic range: 30-96 dB, 2dB/step
- Wall filter: 0-3
- Sweep speed: 0(10.3s), 1(7.67s), 2(5.14s), 3(3.88s), 4(2.62s), 5(1.35s)
- Baseline: 0-6
- Correct Angle: -79° -79°, 1° /step
- Quick Angle: -79° /-60°/-30°/0°/30° /60°/79°
- Invert
- Volume: 0-7
- Pseudo color: 6 types

5. Cine Review and Post-Processing

5.1. Cine Review

- Frame by frame manual review
- Auto playback
- Start frame and end frame are selectable for cine

loop review

- Maximum cine memory is up to :
 - 1227 frames for B mode
 - 409 frames for Color mode
 - 90s for M mode
 - 15s for PW/CW Doppler mode

5.2. Post-Processing

- B Mode: zoom, pseudo color, Gray map
- M Mode: pseudo color, Gray map
- Color Mode: zoom
- PW/CW: pseudo color, Gray map, correct angle

*Not available the stored images and clips in Review

- FRM and CINE file support measurement, comments, bodymark

6. Imaging Storage and Exam Database

6.1. Imaging Storage

- 504MB for data storage
- 500GB hard drive
- Storage up to approximately 224 static images as BMP format(memory); storage up to approximately 227555 static images as BMP format (hard drive)
- Maximum clip is up to:
 - 1227 frames for B mode
 - 409 frames for Color mode
 - 90s for M mode
 - 15s for PW/CW Doppler mode

6.2. File Management

- Support exam storage temporarily without patient information
- Support image files query
- Support delete, rename image files
- Support review image files of current exam or prior exam
- Support store images as BMP, JPG, FRM, AVI, CIN or DCM format
- Support export images to a USB disk
- Support export images and report to DVD

7. Connectivity

- DICOM Storage:
 - Verify SCP
 - Static image store SCU
 - Removable media
 - Manual-transferon demand
- 2 USB Ports
- Video out:
 - VGA
 - Video: PAL/NTSC
 - S-video: PAL/NTSC
- Footswitch port
- Remote port
- Ethernet

8. Preset

- Application
 - Abdomen
 - Obstetric
 - Gynecology
 - Small Parts
 - Urology
 - Vascular
 - Cardiac
 - Pediatric
- Transducer specific presets:
 - Abdomen
 - Abd Difficult
 - Aorta
 - Obstetric 1/3
 - Obstetric 2/3
 - Fetal Cardiac
 - Gynecology
 - Endovaginal
 - Breast
 - Thyroid
 - Superficial
 - MSK
 - Testicle
 - Endorectal
- Urology

Carotid
 PV Artery
 PV Vein
 Adult Cardiac
 Pedia Cardiac
 PeidaAbd

- User customizable presets: Add, Copy, Delete, Rename

9. Peripheral & Accession

9.1. Printer

- Black/white Digital/Analog Video printer
 - SONY UP-X898MD
 - SONY UP-897MD
 - MITSUBISHI P93W_Z
- Color Digital video printer
 - SONY UP-D25MD
- Color Analog video printer
 - SONY UP-25MD
- Graph/text printer
 - HP Laserjet Pro 400 M401d
 - HP Laserjet M403D
 - HP Laserjet M402D
 - HP Deskjet Ink Advantage Ultra 2029
 - HP Deskjet 1112,
 - CANON_E518,
 - CANON_IP_2780,
 - EPSON_L130,
 - EPSON_L310,
 - EPSON_L383
- Print Proxy

9.2. DVD Type

- SAMSUNG SE-208
- LENOVO DB75
- LITEON eBAU108

9.3. Needle Guide Bracket

- **BGK-C5-2**
 - Focus Depth: 45mm
 - Angle: 40°
- **BGK-R50UB**

- Focus Depth: 45mm
- Angle: 35°

- **BGK-L40UB**

- Focus Depth: 30mm
- Angle: 43°

- **BGK-CR10UA**

- Focus Depth: 250mm
- Angle: 3°

- **BGK-R10UB**

- Focus Depth: 20mm
- Angle: 35°

- **BGK-R15UB**

- Focus Depth: 20mm
- Angle: 35°

- **BGK-R20UB**

- Focus Depth: 40mm
- Angle: 35°

- **BGK-L50UB**

- Focus Depth: 45mm
- Angle: 44°

9.4. DVD Type

- SAMSUNG SE-208
- LENOVO DB75
- LITEON eBAU108

10. Measurement and Report

10.1. General Measurement

- **B Mode**

- Distance
- Cir/Area
- Volume: 2-Axis, 3-Axis, 3-Axis(LWH)
- Ratio
- Angle
- %Stenosis:Distance, Area
- Histogram

- **M Mode**

- Distance
- Time
- Slope
- Heart Rate

- **Doppler**

- Velocity
- Heart Rate
- Time
- Acceleration
- RI
- PI
- Auto: PS, ED, RI, PI, S/D
- Trace Direction: Above, below, Dual
- Trace Sensitivity+
- Trace Sensitivity-

Available for Cardiac application:

- Velocity
- PG
- Time
- Heart Rate
- Slope
- PHT
- Trace(Maual)

10.2. Application Measurement

- **Abdomen**

- Liver: Length, Width, Height
- Portal V. Diameter
- CBD
- Gallbladder: Length,Width, Height
- GB wall
- Pancreatic: Duct, Head, Body, Tail
- Spleen: Length, Width, Height

- **Gynecology**

B mode

- UT:Length, Width, Height, UT, UT-V
- OV-Vol(L/R): Length, Width, Height, OV-Vol
- FO(L/R, Number:4): D1, D2, D3, Vol
- CX-L
- UT-L/CX-L

PW mode

- Velocity, L UT A, R UT A, L OV A, R OV A, Trace Direction, Trace Sensitivity+, Trace Sensitivity-

- **Obstetric**

B mode

- GS , CRL, NT, BPD, HC, AC, FL, AFI, EFW,TAD, APAD, HUM, CER, FTA, OFD, THD, FBP
- FBP
- Growth Curve

- EDC

PW mode

- Velocity, FHR, Umb A, MCA, Fetal AO, Desc.AO, Placent A, Ductus V, Trace Direction, Trace Sensitivity+, Trace Sensitivity-

M mode

- FHR, Time, Slope

● Cardiac

M mode

- LV: TEICHHOLZ(LVIDd, LVIDs, ET, HR, EDV, EDS, SV, CO, EF, FS, SI, CI, MVCF, BSA), CUBE(LVIDd, LVIDs, ET, HR, EDV, EDS, SV, CO, EF, FS, SI, CI, MVCF, BSA)
- Mitral Valve: EF Slope, ACV, A/E, Valve Volume
- Aorta: LAD/AOD, Valve Volume)
- Heart Rate
- LVET: LVET
- LVMW: LVPWd, IVSTd, LVIDd, LVMW

B mode

- RV
- LV: S-P Ellipse (LVLd, LVALd, LVLs, LVALs, EDV, ESV, SV, CO, EF, SI, CI, BSA), B-P Ellipse (LVALd, LVAMd, LVIDd, LVALs, LVAMs, LVIDs, EDV, ESV, SV, CO, EF, SI, CI, BSA), Bullet (LVAMd, LVLd, LVAMs, LVLs, EDV, ESV, SV, CO, EF, SI, CI, BSA), Mod. Simpson(LVAMd, LVLd, LVAPd, LVAMs, LVLs, LVAPs, EDV, ESV, SV, CO, EF, SI, CI, BSA)
- PA

● Urology

- Renal: Length, Width, Height, Cortex
- Pre-void Bladder: Length, Width, Height
- Post-void Bladder: Length, Width, Height
- Prostate: Length, Width, Height
- Seminal: Length, Width, Height
- Testis: Length, Width, Height
- Renal Artery
- Arcuate Artery
- Segmental Artery
- Interlobar Artery

● Small Part

- L.THY-V: Length, Width, Height, Volume
- R.THY-V: Length, Width, Height, Volume
- Isthmus

● Urology

- BLV: Length, Width, Height, Volume

- RUV: Length, Width, Height, Volume

- Prostate Vol: Length, Width, Height, Volume, PPSA, PSAD

- ADR(L/R): Length, Width, Height

- KID(L/D): Length, Width, Height, Volume **Vascular**

- Velocity, CCA, ICA, ECA, Vert A, Upper, Lower, Trace Direction, Trace Sensitivity+, Trace Sensitivity-

***For more measurement information, please refer to the User Manual.**

10.3. Report

- Worksheet
- Diagnostic
- Export as PDF format
- 1~4 Image selected
- Only print image in USB report

11. Transducers

● C5-2b

- Imaging Format: convex array
- Number of Elements: 128
- Convex Radius: 60 mm
- FOV: 60°
- Bandwidth: 2.0-6.0MHz
- Fundamental Frequency: 2.5 MHz, 3.5MHz, 4.0MHz
- Harmonic Frequency: H5.0MHz, H6.0MHz
- Doppler Frequency: 2.5MHz, 3.0MHz
- Depth: 19-324mm
- Frame Rate(18cm, Full of FOV) : max 55 f/s
- PW velocity : max 4.46m/s($\pm 60^\circ$)
- Applications: Abdomen, OB, Gynecology, Urology
- Needle Guide Bracket: BGK-C5-2(16G, 18G, 20G, 22G)

● C352UB

- Imaging Format: convex array
- Number of Elements: 128
- Convex Radius: 50 mm
- FOV: 70°
- Bandwidth: 2.0-6.0MHz
- Fundamental Frequency: 2.5 MHz, 3.5MHz, 4.5MHz
- Harmonic Frequency: H5.0MHz, H5.4MHz
- Doppler Frequency: 2.5MHz, 3.0MHz

- Depth: 19-324mm
- Frame Rate(18cm, Full of FOV): max 58 f/s
- PW velocity: max 3.01m/s($\pm 60^\circ$)
- Applications: Abdomen, OB, Gynecology, Urology
- Needle Guide Bracket: BGK-R50UB(16G, 18G, 20G, 22G)

● L742UB

- Imaging Format: general linear array
- Number of Elements: 128
- Footprint: 38 mm
- Bandwidth: 5.0-10.0MHz
- Fundamental Frequency: 6.5 MHz, 7.5MHz, 8.5MHz
- Harmonic Frequency: 9.0 MHz, 9.4MHz
- Doppler Frequency: 5.5MHz, 6.5MHz
- Depth: 29-127mm
- PW velocity : max 1.36m/s($\pm 60^\circ$)
- Applications: SMP, MSK, Vascular
- Needle Guide Bracket: BGK-L40UB(16G, 18G, 20G, 22G)

● L1042UB

- Imaging Format: general linear array
- Number of Elements: 128
- Footprint: 38mm
- Bandwidth: 5.0-13.4MHz
- Fundamental Frequency: 8.0 MHz, 9.5MHz, 11.0MHz
- Harmonic Frequency: 13.0 MHz, 13.4MHz
- Doppler Frequency: 5.5MHz, 6.5MHz
- Depth: 19-108mm
- PW velocity : max 1.99m/s($\pm 60^\circ$)
- Applications: SMP, MSK, Vascular
- Needle Guide Bracket: BGK-L40UB(16G, 18G, 20G, 22G)

● L15-7b

- Imaging Format: high frequency linear array
- Number of Elements: 128
- Footprint: 38mm
- Bandwidth: 7.0-16.0MHz
- Fundamental Frequency: 10.0MHz, 12.0MHz, 14.0MHz
- Harmonic Frequency: 14.4 MHz, 14.8MHz
- Doppler Frequency: 7.2MHz, 8.0MHz
- Depth: 19-108mm
- PW velocity: max 1.69m/s($\pm 60^\circ$)

- Applications: SMP, MSK, Vascular
- Needle Guide Bracket: BGK-L40UB(16G, 18G, 20G, 22G)

● L552UB

- Imaging Format: general linear array
- Number of Elements: 128
- Footprint: 50 mm
- Bandwidth: 3.7-7.6MHz
- Fundamental Frequency: 4.5 MHz, 5.5MHz, 6.5MHz
- Harmonic Frequency: 5.6 MHz, 6.0MHz
- Doppler Frequency: 4.0MHz, 5.0MHz
- Depth: 19-157mm
- PW velocity : max 1.39m/s($\pm 60^\circ$)
- Applications: MSK, Vascular
- Needle Guide Bracket: BGK-L50UB(16G, 18G, 20G, 22G)

● E612UB

- Imaging Format: endocavitymicro convex array
- Number of elements: 128
- Convex Radius: 10 mm
- FOV: 145°
- Bandwidth: 4.0-9.4MHz
- Fundamental Frequency: 5.5MHz, 6.5MHz, 7.5MHz
- Harmonic Frequency: 9.0 MHz, 9.4MHz
- Doppler Frequency: 5.0MHz, 6.0MHz
- Depth: 19-127mm
- Frame Rate(10cm, Full of FOV): max 31 f/s
- PW velocity : max 1.56m/s($\pm 60^\circ$)
- Applications: OB, Gynecology, Urology
- Needle Guide Bracket: BGK-CR10UA(16G)

● C612UB

- Imaging Format: micro convex array
- Number of elements: 128
- Convex Radius: 10 mm
- FOV: 150°
- Bandwidth: 4.7-9.5MHz
- Fundamental Frequency: 5.5 MHz, 6.5MHz, 7.5MHz
- Harmonic Frequency: 9.0 MHz, 9.4MHz
- Doppler Frequency: 5.0MHz, 6.0MHz
- Depth: 19-127mm
- Frame Rate(10cm, Full of FOV): max 94 f/s
- PW velocity: max 2.23m/s($\pm 60^\circ$)
- Applications: Pediatric, Pediatric Cardiac
- Needle Guide Bracket: BGK-R10UB(16G, 18G, 20G,

22G)

- **C6152UB**

- Imaging Format: micro convex array
- Number of elements: 128
- Convex Radius: 15 mm
- FOV: 100°
- Bandwidth: 4.3-9.3MHz
- Fundamental Frequency: 5.5 MHz, 6.5MHz, 7.5MHz
- Harmonic Frequency: 9.0 MHz, 9.4MHz
- Doppler Frequency: 4.0MHz, 5.0MHz
- Depth: 19-127mm
- Frame Rate(10cm, Full of FOV): max 94 f/s
- PW velocity : max 2.53m/s($\pm 60^\circ$)
- Applications: Pediatric, Pediatric Cardiac
- Needle Guide Bracket: BGK-R15UB(16G, 18G, 20G, 22G)

- **C422UB**

- Imaging Format: micro convex array
- Number of elements: 128
- Convex Radius: 20 mm
- FOV: 100°
- Bandwidth: 2.6-5.5MHz
- Fundamental Frequency: 3.0MHz, 4.0MHz, 5.0MHz
- Harmonic Frequency: 5.0 MHz, 5.4MHz
- Doppler Frequency: 2.5MHz, 3.0MHz
- Depth: 19-196mm
- Frame Rate(18cm, Full of FOV): max 58 f/s
- PW velocity: max 2.79m/s($\pm 60^\circ$)
- Applications: Abdomen, Cardiac, Pediatric
- Needle Guide Bracket: BGK-R20UB(16G, 18G, 20G, 22G)

- **P5-1b**

- Imaging Format: phased array
- Number of Elements: 64
- Footprint: 16 mm
- FOV: 90°
- Bandwidth: 1.8-4.3MHz
- Fundamental Frequency: 2.0MHz, 2.5MHz, 3.0MHz
- Harmonic Frequency: 4.0 MHz, 5.0MHz
- Doppler Frequency: 2.0MHz, 2.5MHz
- CW Frequency CW: 2.0MHz
- Depth: 19-314mm
- Frame Rate(18cm, Full of FOV): max 55 f/s
- PW velocity: max 5.16m/s($\pm 60^\circ$)

- CW velocity: max 30.44m/s($\pm 60^\circ$)
- Applications: Adult Cardiac
- Needle Guide: unavailable

12. Regulatory approvals

- FDA Class II Device
- CD/MDD Class IIa
- IEC 60601-1: Medical Equipment Safety
- IEC 60601-1-2: Medical Device Electromagnetic Safety
- IEC 60601-2-37: Ultrasonic Medical Equipment Safety
- IEC 62133: Battery Safety
- IEC 62304: Medical Device Software Life-cycle Process
- IEC 62366: Medical Device Usability Engineering
- EN ISO 14971: Medical Device Risk Management
- ISO 10993: Medical Device Biocompatibility
- NEMA UD 2: Output Measurement for Diagnostic Ultrasound Equipment
- NEMA UD 3: Display of Thermal and Mechanical Acoustic Output Indices on Diagnostic Ultrasound Equipment