

U60 Vet Series

Diagnostic Ultrasound System

Version 1.1

System Overview

Application

- OB
- Abdomen
- Muscle & Tendon
- Cardiology
- Small parts
- Vascular

Transducer Types

- Convex array
- Linear array
- Phased array
- Transrectal array

Imaging Modes

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

Imaging Technique & Function

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

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

System Language Support

- Software : English
- Keyboard input: English, Chinese, Russian
- Control panel overlay: English, Chinese
- User Manual: English, Chinese

Standard Features

- L1042UB (only for domestic marketing)
- C612UB (only for domestic marketing)
- Battery (only for domestic marketing)
- Hard disk
- USB Disk (only for international marketing)

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- Coupling gel

Optional Features

- Transducers
- Printers
- USB Disk (only for domestic marketing)
- Battery (only for international marketing)
- Needle Guide Bracket Kit
- Mobile trolley
- Footswitch
- Hand carried bag
- Dustproof cloth
- DICOM 3.0
- External DVD

Physical Specification

System Architecture

Physical Channels	64
System Dynamic Range	0-166 dB
Beam Forming	Dual beam
Memory	504 MB
Hard Drive	500 GB
Operating System	Linux

Dimensions and Weight

Height	35 cm
Width	37 cm
Depth	22 cm
Weight	< 8.5 kg (without probe and battery)

Monitor

- 15" 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 85°, Down 85°, Left 85°, Right 85°

- Brightness and Color Temp adjustable
- Angle adjustable: 0°, 15°, 30°
- Built-in stereo speaker

Transducer port and holder

- 2 active ports
- 2 holders

Electrical Power

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

Battery

- Rechargeable lithium ion battery
- Capacity: 5000 mAh
- Removable
- Approximately 80 minutes of typical ultrasound exam use
- Max charging time: 8 hours

Environment Requirements

Operating Environment

Ambient temperature	0°C to 40°C
Relative Humidity	15%~95% (no condensation)
Atmospheric pressure	86kPa-106kPa

Storage Environment

Ambient temperature	-20°C to 55°C
Relative Humidity	15%~95% (no condensation)
Atmospheric pressure	70 kPa-106 kPa

User Interface

Control Panel

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

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- Physical keyboard

System boot-up

- Boot up from complete shut-down in about 45 sec
- Shut-down in about 3 sec
- Recovery from screen saver in about 3 sec

Comments

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

Body Mark

- Up to 55 Body Mark graphics in library

Screen Information

- EDAN logo
- Hospital name
- Date
- Time
- Host Name
- Animal ID
- Gender
- Species
- Transducer model
- 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.**

Imaging Parameters

B- mode

Image Type	Detail/ Penetration	Soft/	HContrast/
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- 32.4 cm		
Frequency	2.0-15.0 MHz (3 fundamental & 2 harmonic frequencies)		
eSRI	0-8		
Rejection	0-7		
Scan Angle	0-3		
Gain	0-130 dB, 2 dB/step		
TGC	8 segments		
Dynamic Range	30-150 dB, 4 dB/step		
Scan Mode	Hidden/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	0/90/180/270		
B/W Invert	On/Off		
Spatial	On/Off (max 3angles)		
Compounding			
Display Format	single(B),dual(B+B), quad(4B)		

M- mode

Sweep Speed	0-3
Line Average	0-7
Gray Map	0-14
Pseudo Color	6 types

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Gain	0-130 dB, 2 dB/step
Frequency	2.0-15.0 MHz (3 fundamental and 2 harmonic frequencies)
Dynamic Range	30-150 dB, step 4 dB/step
B/M Display	U/D, L/R

Color Doppler

Flow Type	H Flow/M Flow/L Flow
Dual Live	B/B+C
ROI	Adjustable ROI
Size/Position	
ROI Color	Green, Yellow
Frequency	2.5-8.0 MHz
Gain	1-80 dB, 1 dB/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- 11 kHz
Scale	9-175 cm/s
Baseline	0-6
Threshold	0-15
Invert	On/Off
Packet Size	4 levels

Power Doppler Imaging

Flow Type	H Flow/M Flow/L Flow
Dual Live	B/B+PDI
DPDI	Directional Power Doppler Imaging
ROI	Adjustable ROI
Size/Position	
ROI Color	Green, Yellow
Frequency	2.5-8.0 MHz
Gain	1-80 dB, 1 dB/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

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 1-15 kHz
Gain	1-80 dB, 1 dB/step
Dynamic Range	30-90 dB, 2 dB/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

Continuous Wave Doppler

Flow Type	H Flow/ M Flow/ L Flow
Frequency	2.0 MHz

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PRF	0-32, 0.8-80 kHz
Gain	1-80 dB, 1 dB/step
Dynamic Range	30-90 dB, 2 dB/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°
Steer	0° , ±10° (available on linear transducers)
Volume	0-7
Pseudo Color	6 types

Cine Review and Post-Processing

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

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

Imaging Storage and Exam Database

Imaging Storage

- 500 GB hard drive
- 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 M90s
 - 15s for PW/CW Doppler mode

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

Connectivity

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

Preset

- Application:

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- Abdomen
- Obstetric
- Small Parts
- Vascular
- Cardiac
- Transducer specific presets:
 - Abd-Large
 - Abd-Small
 - Abd-Medium
 - Kidney
 - OB Canine
 - OB Feline
 - OB Equine
 - OB Bovine
 - OB Ovine
 - OB others
 - Cardiac
 - Muscle
 - Tendon
 - Peri. Artery
 - Small Parts
 - Superficial
- User customizable presets: Add, Copy, Delete, Rename

- HP Deskjet Ink Advantage Ultra 2029
- HP Deskjet 1112,
- CANON_E518,
- CANON_IP_2780,
- EPSON_L130,
- EPSON_L310,
- EPSON_L383
- Print Proxy

DVD Type

- SAMSUNG SE-208
- LENOVO DB75
- LITEON eBAU108

Measurement and Report

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

Peripheral & Accession

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

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- Trace Direction: Above, below, Dual
- Trace Sensitivity+
- Trace Sensitivity-

Application Measurement

- **Abdomen**

- CBD
- Gallbladder: Length, Width, Height
- Kidney(Left/Right): Length, Width, Height
- Bladder: Length, Width, Height

- **Obstetric**

- **Canine**

- CRL, GSD, HD, BD, HD&BD
 - MA

- **Feline**

- HD, BD
 - MA

- **Equine**

- GSD-H, GSD-V
 - MA

- **Bovine**

- CRL, TD, HD
 - MA

- **Ovine**

- CRL, BPD
 - MA

- **Others**

- CRL, GSD, BPD, HD, BD
 - MA

- **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, AVSA
- 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

- **Kidney**

- Kidney(Left/Right): Length, Width, Height

- **Vascular**

- Velocity
 - Forelimb, Hindlimb, CCA, ICA, ECA, Vert A(support Manual trace &Auto trace, calculation including PS, ED, S/D, RI and PI)
 - Trace Direction, Trace Sensitivity+, Trace Sensitivity-

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

- **Report**

- Worksheet
 - Diagnostic
 - Export as PDF format
 - 1~4 Image selected

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Transducers

Transducer	C5-2b	L15-7b	P5-1Q
Imaging Format	Convex array	High frequency linear array	Phased array
Number of Elements	128	128	64
Convex Radius	60 mm	38 mm	NA
Footprint	NA	NA	16 mm
FOV	60°	NA	90°
Bandwidth	2.0-6.0 MHz	7.0-16.0 MHz	1.8-4.3 MHz
Fundamental Frequency	2.5 MHz, 3.5 MHz, 4.0 MHz	10.0 MHz, 12.0 MHz, 14.0 MHz	2.0 MHz, 2.5 MHz, 3.0 MHz
Harmonic Frequency	H5.0 MHz, H6.0 MHz	14.4 MHz, 14.8 MHz	4.0 MHz, 5.0 MHz
Doppler Frequency	2.5 MHz, 3.0 MHz	7.2 MHz, 8.0 MHz	2.0 MHz, 2.5 MHz
CW Frequency	NA	NA	2.0 MHz
Depth	19-324 mm	19-108 mm	19-314 mm
Frame Rate	(18cm, Full of FOV) max 55 f/s	NA	(18cm, Full of FOV) max 55 f/s
Max. PW Velocity (± 60°)	4.46 m/s	1.69 m/s	5.16 m/s
Max. CW Velocity (± 60°)	NA	NA	30.44 m/s
Applications	Abd-small, Abd-medium, OB Ovine, OB Others	Peri.Artery, Superficial, Tendon	Cardiac
Needle Guide Bracket	BGK-C5-2 (16G, 18G, 20G, 22G)	BGK-L40UB (16G, 18G, 20G, 22G)	Unavailable

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Transducer	L742UB	L1042UB	L552UB
Imaging Format	General linear array	General linear array	General linear array
Footprint	38 mm	38 mm	50 mm
Bandwidth	5.0-10.0 MHz	5.0-13.4 MHz	3.7-7.6 MHz
Depth	29-127 mm	19-108 mm	19-157 mm
Applications	Abd-Small, Kidney, OB Feline, Tendon, Peri. Artery, Superficial,	Abd-Small, OB Feline, Tendon, Peri. Artery, Superficial	Abd-Small, Abd-Medium, Peri. Artery, Small Parts, OB Others, Tendon
Needle Guide Bracket	BGK-L40UB (16G, 18G, 20G, 22G)	BGK-L40UB (16G, 18G, 20G, 22G)	BGK-L50UB (16G, 18G, 20G, 22G)

Transducer	C612UB	C6152UB	C422UB
Imaging Format	Micro convex array	Micro convex array	Micro convex array
Convex Radius	10 mm	15 mm	20 mm
FOV	150°	100°	100°
Bandwidth	4.9-9.5 MHz	4.9-9.3 MHz	2.6-5.5 MHz
Depth	19-127 mm	19-127 mm	19-196 mm
Applications	Abd-Small, OB Canine, OB Feline, OB Others, Cardiac	Abd-Small, Kidney, Cardiac, OB Canine, OB Feline, OB Others,	Abd-Small, Abd-Large, OB Ovine, OB Others
Needle Guide Bracket	BGK-R10UB (16G, 18G, 20G, 22G)	BGK-R15UB (16G, 18G, 20G, 22G)	BGK-R20UB (16G, 18G, 20G, 22G)

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Transducer	V742UB	V562-1UB	C352UB
Imaging Format	Endorectal linear array	Endorectal linear array	Convex array
Convex Radius	NA	NA	50 mm
Footprint	38 mm	57 mm	NA
FOV	NA	NA	70°
Bandwidth	5.0-10.0 MHz	3.0-7.0 MHz	2.0-6.0 MHz
Depth	29-127 mm	19-157 mm	19-324 mm
Applications	OB Bovine, OB Equine, Muscle, Tendon	OB Bovine, OB Equine, Muscle, Tendon	Abd-Small, Abd-Large, OB Ovine, OB Others
Needle Guide Bracket	Unavailable	Unavailable	BGK-R50UB (16G, 18G, 20G, 22G)

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

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