TECHNICAL SPECIFICATION

Version 1.0

ALPINION
MEDICAL SYSTEMS
www.alpinion.com

Born Powerful and Compact

The E-CUBE 5 is born "**Powerful and Compact**" integrating ALPINION's core acoustic and imaging technologies. The outstanding image quality results from ALPINION's refined acoustic technology that manages and handles ultrasound signals perfectly. And ALPINION's unique software packages for multiple applications enhance diagnostic confidence and efficiency.

GENERAL OVERVIEW

System overview

Physical dimension

Weight	50kg
Height	1293mm (minimum-monitor folded: 1076.3mm)
Width	505mm
Depth	659mm

System specification

Memory	385 GB hard disk drive
Electrical power	• Voltage: 100 - 120V, 220 - 240V • Frequency: 50/60Hz • Power Consumption: 450 VA
System response time	• Boot time: 90 sec • Shutdown time: 30 sec • Response time: 0.5 sec (2D mode > Duplex mode), 1.0 sec (2D mode > Triplex mode)

Monitor

Physical size	15.6″ wide LED display
Tilt	±30 degree up/down , 90 degree folding, ±135 degree swivel
Screen technology	IPS (In plane switching) technology
Image size	1366 X 768
Video size	880 X 660
Image adjustment	Brightness/Contrast adjustment by OSD buttons
Built-in accessory	Integrated stereo speakers

Control panel

Height adjustment	N/A
Keyboard	QWERTY keyboard
Special keys	• 8 TGC (Time Gain Compensation) slides • 5 soft keys • 2 user-define keys • 14 Power preset keys • Help key
Light	Integrated stereo speakers

System component

- 3 active Transducer ports (3rd port is optional)
- Integrated HDD (Capacity: 385GB)
- DVD-R/W Drive(optional)
- On-board Storage for Peripherals
  > B/W Printer, Color Printer, DVD recorder
  > External printer connection (Inkjet, Digital)
- 3 Transducer holders
- Front Handle
- Wheel-lock Mechanism
  > Total Lock
- 5 USB ports: Front side (1 ea), Back side (4 ea)
- Thumbnail images on-screen

Peripheral and accessory

Basic accessory

Basic accessory
Install DVD (User manual, OS, S/W)
Quick guide (ENG & Multilanguage hard copy)
Sono gel

Optional accessory

Accessory type	Description
Footswitch	Tri-pedal footswitch
Biopsy kit	SC1-6 Biopsy Starter Kit (for C1-6T) L3-12 Biopsy Starter Kit (for L3-12T) EN3-10 Disposable Needle Guide (for EC3-10T, EV3-10T) EN3-10 Reusable Needle Guide (for EC3-10T, EV3-10T)
Software	Full SRI SRI Xpeed Spatial Compounding Imaging Frequency Compounding Imaging Auto IMT Measurement

	FTHI (Filtered Tissue Harmonic) DICOM 3.0 Connectivity DICOM SR (OB) Panoramic Imaging

Optional peripheral

Peripheral type	Description
Color printer	Sony Digital UP-D25MD, Sony Analog UP-25MD
B/W printer	Sony Digital UP-D897 Sony Analog UP-897MD
DVR	Sony Digital DVO-1000MD
DVD-RW	Samsung Digital SE-208

SYSTEM FEATURE

Application

- Abdomen
- Obstetrics
- Gynecology
- Vascular
- Small Parts, Breast, MSK
- Pediatrics
- Emergency Medicine
- Urology

Imaging mode

- 2D mode
- M mode
- Color flow (CF) mode
- M color mode
- Power Doppler mode

- Pulsed Wave Doppler (PWD) mode

Image feature

- Xpeed
- SRI
- Full SRI
- THI (PI/FTHI)
- Beam steering
- Panoramic B/C
- Spatial compounding
- Frequency compounding
- Virtual convex

Annotation

Display component

Component	Description
Institution/Hospital Name	Up to 32 Characters
Date	3 types (YYYY/MM/DD, MM/DD/YYYY, DD/MM/YYYY)
Time	2 types (24 hour, 12 hour)
Operator ID	
Patient Name	First, last, middle name
Patient Identification	Up to 64 Characters (35 characters displayed on banner)
Gestational Age	LMP/EDC/GA
MI	Mechanical Index
TIS	Thermal Index Soft Tissue > TIC (Thermal Index Cranial (Bone)) > TIB (Thermal Index Bone)
System Status	Real-time or frozen
Transducer marker	Marker for indicating the current direction of the transducer
Image Preview	Thumbnails
Gray/Color Bar	The current settings for Gray map/Colorize
CINE Gauge	Show the CINE gauge
Summary Window	Show the measurement summary
Results Window	Show the measurement result (pre-settable display location)

Transducer Type	Show the current transducer that is being operated
Application Name	Show the current application that you are in
Imaging Parameter	Show the available imaging parameters in the current imaging mode (current mode highlighted)

Body pattern

- Arrow
  > Arrow size: S, M, L, XL
  > Rotate Arrow
- Body pattern
- Text
  > Font Color: Green, Yellow, White, Orange
  > Text size: S, M, L

IMAGING MODE

Each imaging mode provides a table of available imaging parameters that you can use.

2D mode

Imaging parameter	Value
Gain	0-90 dB (1dB increment)
Transmit Frequency	3 selectable frequencies (THI is included)
Multi Focus	Max 4
Line Density	5 steps
Dynamic Range	30-192 dB
Persist	4 steps
Reject	10 steps
Gray Map	Max 16 gray maps (0-15)
Colorize	23 color maps (0-22)
Virtual	On/Off
Up/Down	On/Off
Spatial Compounding	3 steps
Angle Steer	6 steps (-9°~+9°)

Frequency Compounding	On/Off
Transmit Power:	1-100% (2% steps)

M mode

Imaging parameter	Value
Sweep Speed	5 steps
Gray map	14 gray maps (0-13)
Colorize	23 color maps (0-22)
Transmit Power	1-100%(2% increment)
Dynamic Range	30-150 Db (3dB)
Reject	10 steps
Gain	0-98 dB (1dB increment)
Full M	On/Off

PD mode

Imaging parameter	Value
Transmit Power:	1-100% (2% steps)
Wall Filter	7 steps
PRF	300Hz-12,100Hz (Transducer dependent)
Persist	10 steps
Frequency	3 selectable frequencies
Invert	On/Off
Scale	kHz, cm/s, m/s
Base Line	40 steps
Ensemble	6 steps
Line Density	2 steps
Colorize	10 color maps (0-9)
Threshold	0-100 %
Angle Steer	6 steps (-9°~+9°)
Smooth	10 steps
Gain	0-100 dB (0.5 dB increment)

CF mode

Imaging parameter	Value
Transmit Power	1-100% (2% steps)
Wall Filter	7 steps
PRF	300Hz-12,100Hz (Transducer dependent)
Persist	10 steps
Frequency	3 selectable frequencies
Invert	On/Off
Scale	kHz, cm/s, m/s
Base Line	40 steps
Ensemble	6 steps
Line Density	2 steps
Colorize	11 color maps (0-10)
Threshold	0-100 %
Angle Steer	6 steps (-9°~+9°)
Smooth	10 steps
Gain	0-100 dB (0.5 dB increment)

PW mode

Imaging parameter	Value
Transmit Power	1-100% (2% steps)
Frequency	3 selectable frequencies
SV Gate Width	13 Steps (0.7,1,2,3,4,5,6,7,8,9,10,11 and 15mm)
Sweep Speed	5 steps
Invert	On/Off
Angle Correct	±89°, (1° step)
Base Line	16 steps
Wall Filter	9 steps
Velocity Scales	Max: 380m/sec (Angle/Transducer dependent) Min: 10cm/sec
Scale	kHz, m/s, cm/s
PRF	300Hz-13,100Hz (Transducer dependent)
Angle Steer	6 steps (-9°~+9°)
Dynamic Range	30-120dB (2dB steps)
gray maps	14 gray maps (0-13)

Colorize	23 color maps (0-22)
Reject	10 steps
Time Resolution	7 steps
Update	Frozen, Live, 2, 3, 4, 8 and 16 sec
Auto Calculation	On/Off
Method	Mean, Max, Both
Direction	Below, Above, Both
Sensitivity	20 steps
Full D	On/Off
Gain	0-98 dB (2dB increment)

Simultaneous mode

Duplex mode

Duplex mode type	Description
2D/PW	PW Doppler mode
2D/CF	Color flow mode
2D/PD	Power Doppler mode
2D/M	Motion mode

Triplex mode

CF Doppler mode (2D/CF/PW)

2D/PW/PD

IMAGING FUNCTION

Display mode

- Maximum display depth: 30 cm (dependent on the transducer type)
- Zoom: Write/ Read/Pan (Write zoom up to 4x; read zoom up to 8x)
- Dual Screen Display
  - Vertical (Top/Bottom): 1:1, 1:2, 2:1
  - Horizontal (Left/Right): 1:1, 1:2, 2:1

- Quad Screen Display

CINE

- CINE frame: 1,500 frames
- Playback speed: 400%, 300%, 200%, 100%, 50% (5 types)
- CINE gauge and CINE image number display
- CINE review: Frame by frame/Loop
- Start and End Frame Selections for Loop Playback
- Measurement and calculation capability

Image archive

- Preview: displays thumbnail images of the acquired data for the current exam
- E-View: An enlarged preview of the image
- Recalling Images from the Preview
- Image Management
  > Select All/Unselect All
  > Permanent Store
- Hard disk drive Image Storage: Min 385GB
- Ethernet Network Connection (100MBPS)
- Archiving Format:
  > DICOM with ultrasound raw data
  > Standard DICOM
  > Secondary Capture
- 5 USB ports
- DVD/CD RW(optional)
- USB, USB HDD
- Export Image Format: *BMP, *JPEG, *DICOM, *WMV, *AVI

Connectivity

- DICOM 3.0 Connectivity
- DICOM Structured Report
- DICOM Verification
- DICOM Storage

- DICOM Storage Commitment
- Modality Work list
- Network Storage

MEASUREMENT AND CALCULATION

Basic measurement

Imaging mode	Measurement menu
2D	• Distance • Ellipse • Trace • % Stenosis • Volume • Spline • A/B Ratio • Angle • Histogram
M	• Distance • HR (Heart Rate) • Slope • % Stenosis • Time • A/B Ratio (% Distance)
PW	• Velocity (min, max, mean) • PI (Pulsatility Index) • RI (Resistance Index) • Trace • A/B Ratio • PG Mean (Pressure Gradient Mean) • PG Max (Pressure Gradient Max.) • Acceleration • HR (Heart Rate) • Time (Velocity Time)

2D/PW	Auto & Manual Trace • PS (Peak Systole) • ED (End Diastole) • MD (Minimum Diastole) • S/D Ratio (Systole/Diastole Ratio) • PI (Pulsatility Index) • RI (Resistance Index) • TAmax (Time avg. max. Velocity) • TAmean (Time avg. mean. Velocity) • VTI (Velocity Time Integral) • Acceleration • HR (Heart Rate)

Labeled measurement

OB measurement

- Abdominal Circumference (AC)
- Anterior Posterior Thoracic Diameter (APTD)
- Binocular Distance (BOD)
- Biparietal Diameter (BPD)
- Clavicle (CLAV)
- Crown Rump Length (CRL)
- Estimated Fetal Weight (EFW)
- Fibula (FIB)
- Femur Length (FL)
- Fetal Trunk Area (FTA)
- Gestational Sac (GS)
- Head Circumference (HC)
- Humerus
- Middle Abdomen Diameter (MAD)
- Occipital Frontal Diameter (OFD)
- Radius
- Spinal Length (SL)
- Transverse Abdominal Diameter (TAD)
- Transverse Cerebella Diameter (TCD)
- Tibia

- Transverse Thoracic Diameter (TTD)
- Ulna Length (ULNA)
- Multi-Gestational Calculation
  > Up to 4-fetuse comparison of multiple fetuses data on a graph and a worksheet
- OB Worksheet
- Patient Information
  > Fetus Number
  > CUA/AUA Selection
  > Fetus Position

Report package

• Abdomen	• Pediatrics
• Obstetrics	• Small Parts
• Gynecology	• Breast
• Cardiology	• MSK
• Vascular	• Emergency Medicine (EM)
• Urology	

TRANSDUCER

Transducer naming rule

- **Convex** array transducer: This array transducer is usually designated by the first character "C."
- **Linear** array transducer: This array transducer is usually designated by the first character "L."
- **Endo-cavity** transducer: This transducer is usually designated by the first characters "EC."
- **Endo-vaginal** transducer: This transducer is usually designated by the first character "E" or "EV."

Transducer list

Type	Transducer name
Convex array	C1-6T
Linear array	L3-12T
Endo-vaginal	EC3-10T EV3-10T

Transducer information

C1-6T

Application	Abdomen, Renal, Urology, OB/GYN
Type	Convex array
Frequency	1.0 - 6.0 MHz
Convex Radius	60 mm
FOV	60°
Element	128
Biopsy kit	Available

L3-12T

Application	Small Parts, Breast, Carotid, MSK, Nerve Block, Peripheral Vascular, Pediatric Abdomen, Bowel, Neonatal Head
Type	Linear array
Frequency	3.0 - 12.0 MHz
Aperture length	38.4 mm

FOV	N/A
Element	128
Biopsy kit	Available

EC3-10T

Application	OB/GYN, Fetal Echo, Urology, Emergency Medicine
Type	Endo-vaginal
Frequency	3.0 - 10.0 MHz
Convex radius	10 mm
FOV	142°
Element	128
Biopsy kit	Available

EV3-10T

Application	OB/GYN, Fetal Echo, Urology, Emergency Medicine
Type	Endo-vaginal
Frequency	3.0 - 10.0 MHz
Convex radius	10 mm
FOV	142°
Element	128
Biopsy kit	Available