



DATA SHEET



Model: ESE-20

Ultrasound system



Description

Mobile, solid and affordable ESE-20 provides excellent value across the full range of general imaging and women healthcare applications. It is also perfect for regional nerve block, musculoskeletal, rheumatology applications by:

- Exceptional image quality including high end 3D/4D capability
- Versatile features and functions
- Amazing superficial imaging for breast and other small parts.
- Easy to use workflow with touch panel and 19" monitor

System Overview

Architecture

- The revolutionary RF platform, The First In The World , allows for more accurate information. This platform transfers all RF data for computing without any information loss. It has a much better advantage in detail imaging than current advanced platforms
- Thanks to the RF platform, it allows the development of many RF based processing algorithms, which have ultra premium contrast and resolution imaging
- This unique platform is capable of processing multiple data streams simultaneously
- Up to 25MHz next generation digital broadband and high resolution acoustic beamforming
- The new 12 bit, low noise, digital circuitry, with up to 280db dynamic range has improved 2D performance and increased Doppler sensitivity

- Next generation adaptive image processing for noise and artifact reduction that improves tissue presentation and edge definition
- Fully independent, triplex multiple mode operation for easy in Doppler procedures
- Multi processors allow simultaneous mode changes and support for advanced system functionality
- Free view* (Optional)
- Tissue Doppler (TD) mode
- Tissue Velocity Imaging TVI)mode*(optional)
- Tissue Velocity M (TVM) mode*(optional)
- Multi Angle M mode*(optional)
- Stress echo*(optional)

Standard features

- Up to 25Mhz high frequency in system platform
- RF platform and RF data processing
- Up to 1500 seconds standard cine storage
- 1T HDD
- Integrated black/white thermal video printer slot
- Patient information database
- Image archive on hard drive
- Quick store to USB memory stick
- Quick store to hard drive
- Quick print to B/W and color thermal video printer
- Network storage and printing
- Full measurement and analysis package
- Real time auto wave Doppler track and calculations
- Vascular calculations

- Cardiac calculations
- OB calculations and tables
- Gynecological calculations
- Urological calculations
- Renal calculations
- Volume calculations
- Wireless networking for easy data sharing, storage and printing* (Optional)
- Up-to-date connectivity and data management solutions, wireless (optional), LAN, integrated database
- DICOM compatibility* (Optional)
- Four active probe ports
- 3 USB ports
- 8 TGC slides
- Average 4 multiple adjustable frequency in every probe and mode
- Up to 512 line density

Ergonomics

- Unique human oriented design for comfort and convenience
- Operation panel up and down adjustment
- Fully articulating 19-inch high resolution flat panel display
- 4 easy access transducer ports
- 4 transducer holders (removable for easy cleaning)
- Integrated touchable alphabetic keyboard
- Simple, easy and effective cable management structure

Keyboard

- Highly sensitive 10 inch capacity touch panel
- Intuitive, configurable and touchable interactive operation interface
- Ergonomic hard keys for general ultrasound operations
- 8 TGC slides, functionality at any depth
- Backlight keys

Image display screen

- 19 inch high resolution LCD technology
- Brightness, contrast and color temperature adjustment
- Big angel swivel and tilting capability
- Peripherals
 - B&W thermal video printer: Sony UPD897MD (optional)
 - Color thermal video printer: Sony UPD25MD (optional)
 - Memory stick (optional)

Dimensions and Weight

- Height: 1350mm
- Width: 520mm
- Depth: 835mm
- Weight: 55kg

Electrical Power

- Voltage: 100-240V AC
- Frequency: 50/60Hz
- Power: < 400VA for console only

Transducers

Transducer Technology

- Xcen technology for wideband frequency
- Purewave technology for high resolution imaging
- Unique and high technical Xcen probe connector to adapt all different type of product models

Transducer types

- Convex array
- Linear array
- Phase array
- 4D probe
- Endocavity probe
- Micro convex array

Transducer selection

- Electronic switching of transducers
- User customizable imaging presets for each transducer and application
- Automatic dynamic receiving focus in all transducers
- Multiple adjustable transmit focal zone, up to 8 focal zoom

F2-5C Broadband Curved Array

- Field of view: 59 degree
- Convex radius: 60mm
- Application: abdomen, OB/Gyn , urology, pediatric
- Frequency range: 1.6 5.3MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

D3-6C broadband curved array volume probe

- Field of view: 75 degree
- Convex radius: 40mm
- Application: abdomen, Gyn, urology
- Frequency range: 1.8 6.3 MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic, 3D/4D grayscale
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

G4-9M broadband micro convex array

- Field of view: 136 degree
- Convex radius: 12mm
- Application: pediatric, abdomen, cardiac
- Frequency range: 3.2 12.2MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

G4-9E broadband micro convex endocavity array

- Field of view: 136 degree
- Convex radius: 12mm
- Application: Ob/Gyn , urology
- Frequency range: 3.2 12.5MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

G1-4P phased array

- Applications: cardiac, abdomen, Urology
- Field of view 90 degree
- Frequency range: 1.09 4.18Mhz
- Pulsed wave Doppler, continuous wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

F4-9E broadband micro convex endocavity array

- Field of view: 150 degree
- Convex radius: 10mm
- Application: Ob/Gyn , urology
- Frequency range: 3.3 11MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes
- Reusable biopsy guide available

F4-12L broadband linear array

- Fine pitch, high resolution
- Applications: vascular, small parts
- Frequency range: 4.0 12.1MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

X4-12L broadband linear array

- Fine pitch, high resolution
- Applications: vascular, small parts
- Frequency range: 3.3 12.6MHz
- Pulsed wave Doppler, color Doppler, power Doppler, harmonic
- Multi imaging frequency setting in 2D, Harmonic, color Doppler and Wave Doppler modes

Advanced Imaging controls

VFusion

- Available on all transducers and for 2D,3D/4D
- Up to 5 levels of directional imaging fusion to enrich information
- Operate in conjunction with VSpeckle, harmonic imaging

VSpeckle

- Available on all transducers and for 2D,3D/4D
- Virtually eliminate speckle noise artifact and dynamically enhances tissue margins
- Selectable multiple levels of speckle noise reduction and smoothing
- Operates in conjunction with VFusion and harmonic imaging

VTissue *(Optional)

- Advanced imaging processing to adapt to the speed of the ultrasound variation in different tissue
- Improved detail resolution and conspicuity of lesions
- Presentable sound and speed in different applications
- One touch operation to ease diagnosis

3D/4D

- 3D/4D rotation
- Grayscale imaging controls
- Selectable rendering approaches
- Unique high quality rendering algorithm
- Selectable gray maps
- Multi slide cutting
- Cineloop 3D
- Review volume

Tissue Doppler (TD)

- Present wall motion spectrum by using Doppler principle
- Provide wall motion direction and velocity information

Tissue Velocity Imaging (TVI)*(Optional)

- Color codes the velocities in tissue
- Present tissue color imaging by using Doppler principle
- This color image is overlaid onto the 2D image
- Captures low flow but high amplitude signals associated with wall motion

Multi angle M mode (Optional)

- Sample on moving tissue from multi angle
- Present wall motion spectrum based on tissue moving

Next generation RF based image processing

- Available on all imaging transducers in 2D grayscale modes
- Virtually eliminates speckle noise artifact and dynamically enhance tissue edge
- Operates with other real time processing algorithms

Inversion mode*(Optional)

- This render mode is used to display anechoic structures such as vessels
- It invert the gray values of the rendered image, such as black image information become white and vice versa

Magic Cut*(Optional)

- Ability to edit images, make possible to cut away structure obstructing the view in the ROI
- Several cutting methods available

Smart Touch 3D/4D Operation (Optional)

- Fully utilize touch panel possibility for easy operation, such as rotation 3D rendering image, move ROI, create line by finger

Free View (Optional)

- Provide any plane view to visualize the internal tissue information
- Improve the contrast resolution to facilitate the detection of diffuse lesions in organs

Stress Echo (Optional)

- Stress echo is a non invasive, dynamic evaluation of myocardial structure and its function under an external stress (exercise or pharmacology)
- 12 Ready to use templates (max 8 stages*6 views) Editable
- User definable template
- Re arrange & Select default template
- 8 View names available
- 9 Stage names are available
- One Touch Shuffle (Stage / View)
- Touch & Compare any view of stage
- Systole only review

Imaging modes

2D Imaging

- Pre defined ATGC (adaptive temporal gain compensation) curves optimized for consistently excellent imaging
- B/M acoustic output: 0-100%
- Depth : able to adjust from 1 to 36cm
- Select between 1 to 8 transmit focal zones
- Reverse function: on/off
- VFusion function
- VSpeckle function
- Harmonic imaging both tissue harmonic and phase inversion
- Cineloop image review
- Selectable 2D line density
- Dual imaging with independent cineloop
- 256(8 bit) gray level
- Multiple color maps with chroma imaging
- FULL screen imaging to larger image size
- Multi frequency: probe dependent
- Gray filter: 6 steps
- Persistence: 8steps
- Selectable image angles, probe dependent
- Gain: 0-100%
- Dynamic range: 30-280 db
- VSharpen to enhance edge contrast
- Smooth to improve spatial resolution

Harmonic Imaging

- Supports both tissue harmonic and phase inversion imaging (transducer and frequency dependence)
- Second harmonic processing to reduce artifacts and improve image clarity
- Maximize detail resolution and enhance contrast
- Available on all imaging transducers
- Extends high performance imaging capabilities to all patient body types

M mode

- Selectable sweeping rates
- Time marks: 0.025-0.5 second
- Selectable display format prospective or retrospective (1/3 2/3, 1/2 1/2, 2/3 1/3, side by side 1/2 1/2, side by side 1/3 2/3, full screen)
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis of M mode data
- 256 gray levels

Color Doppler mode

- Available on all imaging transducers
- Automatically adapts transmit and receive bandwidth processing based on the color box position
- Cineloop review with full playback control
- Steering on linear array transducers
- Selectable in baseline, line density, flash reduction, persistence, maps, frequency, PRF, wall filter, packet size, color level, sensitivity, focus position, acoustic power, and smooth
- Color gain
- Region of interest
- Baseline invert
- Simultaneous mode during PW mode
- Smoothing
- Wall filter
- Zoom

Power Doppler mode

- High sensitive mode for small vessel visualization
- Available on all transducers
- Cineloop review
- Multiple color maps
- Individual controls for gain
- Selectable baseline, line density, flash reduction, persistence, maps, frequency, PRF, wall filter, packet size, color level, sensitivity, focus position, acoustic power, and smooth
- Adjustable region of interest

Pulsed Wave (PW) Doppler

- Ultra high resolution spectral FFT rate
- Angle correction with automatic velocity scale adjustment
- Normal, invert display around horizontal zero line
- Selectable gray filter, dynamic range, frequency, PRF, wall filter, baseline, angle correct, sample volume
- Selectable sweep speeds: 8 steps
- Maximum velocity range: 12m/s
- PW acoustic output: 0-100%
- Selectable low frequency signal filtering with adjustable wall filter settings
- Selectable grayscale curve for optimal display
- Selectable chroma colorized maps
- Selectable display format prospective or retrospective (1/3 2/3, 1/2 1/2, 2/3 1/3, side by side 1/2 1/2, side by side 1/3 2/3, full screen)
- Auto function to optimize spectral Doppler display.
- Digitally enhanced stereo output
- 256 gray levels
- Post processing in frozen mode includes map, baseline, invert and chroma
- Simultaneous or duplex mode of operation
- Simultaneous 2D, color Doppler, pulsed Doppler
- High PRF capability in all modes including duplex and triplex

Continuous Wave Doppler (Optional)

- Cardiac sector array transducer only
- Maximum velocity range: 18.5m/sec

Pview*(Optional)

- Real time extended field of view composite imaging
- Ability to back up and realign the image during acquisition
- Full zoom, cineloop review and image rotation capabilities
- User can measure distance and area
- Measurement can be made on individual frames during cineloop review
- Available on linear transducers

Tview

- Expand view of scanning
- Available on linear transducers

Auto

- Intelligent one button automatic optimization in 2D and Doppler modes
- Automatically adjust PRF and baseline in Doppler

Touch Panel Interface

2D mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- PView
- Fullscreen
- L/R
- U/D
- Center line
- VSpeckle
- VFusion
- Gray Filter
- Persistence
- Display Format
- Image reference
- Maps
- Frequency
- Focus position
- Focus
- Dynamic Range
- Line density
- VSharpen
- Biopsy
- Image angle
- Focus width
- Smooth
- Acoustic power

M Mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- L/R format
- U/D format
- Maps
- Dynamic range
- Acoustic power
- Sweep speed
- Gray filter
- VSharpen

CF mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- Invert
- Full Screen
- L/R
- U/D
- Baseline
- Flash Reduction
- Line density

- Persistence
- Display format
- Image reference
- Maps
- Frequency
- PRF
- Wall filter
- Packet size
- Colorlevel
- Sensitivity
- Focus position
- Acoustic power
- Smooth

PW/CW mode

- New patient
- BodyPattern
- Archive
- Comments
- End exam
- Sys setting
- Probe&App
- Invert
- Triplex
- Display format
- Sweep speed
- Gray filter
- Dynamic range
- Trace sensitive
- Auto trace
- Mode/direction
- Maps
- Frequency
- PRF
- Wall filter
- Baseline
- Angle correct
- Sample volume
- Volume
- Spectrum optimize
- Acoustic power

3D mode

- Comments
- BodyPattern
- Back to B
- Start3D
- ROI shape
- Render resolution
- Render
- Display format
- Image reference
- View
- Gray map
- VSpeckle
- Quality
- Threshold
- Transparency
- Volume angle
- Movement step (after data acquisition)
- Light position (after data acquisition)
- Rotation angle (after data acquisition)
- Rotation direction (after data acquisition)

- 4D mode
- Comments
- Body Pattern
- Back to B
- Start 4D
- ROI shape
- Movement step
- Rotation direction
- Render
- Display format
- Image reference
- View
- Gray map
- Vspeckle
- Quality
- Threshold
- Transparency
- Volume angle

System Feature

Display modes

- Simultaneous capability
- 2D/PW/CW
- 2D/CF or PDI
- 2D/M
- Dual, 2D/2D
- Dual, 2D/2D+CF or PDI
- Dual, duplex and triplex
- Duplex and Triplex mode
- Quad display in 3D/4D application
- 9 slice images display in 3D/4D application
- Time line display
- Independent dual 2D/PW or CW
- Timed based sweep update mode

Display annotation

- Institution/hospital name
- Date: 2 types selectable, YY/MM/DD, MM/DD/YY
- Time: 2 types selectable, 24hours and 12hours
- Operator identification
- Patient name, first, last
- Patient identification: 30 characters
- Gestational age from LMP/EDC/GA/BBT
- Power output index
- MI: mechanical index
- TIS: thermal index soft tissue
- TIC: thermal index cranial (Bone)
- TIB: thermal index bone
- Probe orientation marker: coincide with a probe orientation marking on the probe
- Gray/color bar
- Measurement result window
- Probe type
- Application name
- Image depth
- Imaging parameters by mode
- 2D/M mode: acoustic power output, gain, frequency, frame rate, dynamic range
- Color mode: color acoustic power output, color gain, color flow frequency, PRF, wall filter
- PW/CW mode: Doppler acoustic power output, Doppler gain, Doppler frequency, PRF, wall filter, sample depth
- Focus zone marker
- Body pattern
- PW and CW scale markers: time/speed

- M scale markers: time/depth, time
- System measurement display
- System message display
- Biopsy guide line
- Heart rate

Cineloop

- Acquisition, storage in memory and display of up to 1500 seconds long of 2D, color and PW/CW images for review

Compare

- Compare live imaging with stored imaging. All live imaging's parameters are same as stored imaging

Quick save feature

- The system provides quick save function through USB stick, internal/external HDD or after exam
- Configurable saving file format, VRD, DICOM, JPEG, BMP, PNG and AVI

Archive

- Patient data input which include patient ID, name, nationality, birth date, sex, exam physician, quality check, exam operator
- Physical data such as weight, height
- Patient exam management
- Patient exam images storage and management
- Import VRD format data into the system from outside media, such as USB stick, external HDD
- Export patient data into outside medias

Report

- Automatically pull patient data into the report
- Automatically load measurement worksheet into the report
- Pull related exams' images into the report
- Write comments in the report
- Print report through network or local printer

Connectivity

- Standard connectivity features
- Local print to on board or off board video printers through USB port
- Page report print
- Image export to removable media (external HDD, USB stick)
- Network linkage
- Image export to network storage servers
- DICOM export and retrieve *(Optional)
- Mobile data transfer solution by:
 - Blue tooth*(Optional)
 - email*(Optional)
 - Hot point connection
 - VCloud * Optional)
- Data storage formats include VRD, DICOM, JPEG, BMP, PNG, AVI
- VRD and DICOM images stored in disc can be recalled on the system
- JPEG, BMP, PNG and AVI images can be played on normal computers
- On board patient exam storage
- Direct digital storage of static image or cineloop images to internal hard disk drives
- Fully integrated user interface

Probes/application

- Selectable multiple applications
- Edit exist application preset
- Edit user defined preset
- Rename preset
- Return to factory preset
- Quick save user defined parameters in related application

Safety Conformance

- Regulatory Notice:
This device is tested to meet all applicable requirements in relevant. According to 93/42 EEC, it is class IIa medical device.
- Conformity to Standards:
IEC 60601 1 : 2012 Medical electrical equipment Part 1: General requirements for basic safety and essential performance
- IEC 60601 1 2:2007 Electromagnetic compatibility Requirements and tests
- IEC 60601 1 6:2010 Usability
- IEC 60601 2 37:2007 Medical electrical equipment Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
- IEC 61157:2007 Declaration of acoustic output parameters
- ISO 10993 1:2009 Biological evaluation of medical devices
- IEC 62304:2006 Medical device software Software life cycle processes
- IEC 62366:2007 Medical devices Application of usability engineering to medical devices
- Council Directive 93/42/EEC on Medical Device
- WEEE according to 2012/19/EU
- RoHS according to 2011/65/EU

Measurement and Analysis

Generic Measurement in 2D mode

- Depth
- Distance
- Perimeter
- Length and width method
- Ellipse method
- Polygon method
- Spline method
- Tracing method
- Area
- Length and width method
- Ellipse method
- Polygon method
- Spline method
- Tracing method
- Volume
- Single line method
- Dual line method
- Triple line method
- Single ellipse method
- Single ellipse and single line method
- Angle
- Stenosis
- Diameter method
- Square meter method
- A and B ratio
- Diameter ratio
- Square meter ratio

Generic Measurement in CFM mode

- CFV
- point
- profile

Generic Measurement in M mode

- Depth
- Distance
- Time
- Speed
- Heart rate
- Stenosis
- A and B ratio
- Diameter ratio
- Time ratio
- Speed ratio

Generic Measurement in PW mode

- Speed (include PV (Peak))
- Time (include AT (Accelerate))
- Acceleration
- PS (Peak Speed in systole period)
- ED (The speed in the end of diastole period)
- MD (Minimum speed in diastole period)
- TAMAX (maximum speed in time average)
- TAMEAN (mean speed in time average)
- TAMIN minimum speed in time average)
- PI (Pulsatility Index)
- RI (Resistance Index)
- PS and ED ratio
- ED and PS ratio
- A and B ratio (A/B ratio)
- Speed ratio
- Time ratio
- Acceleration ratio
- FLOWVOL (FlowVolume)
- MaxPG (maximum pressure gradient)
- MeanPG (Mean pressure gradient)
- SV (Stroke volume)
- Each volume diameter cardiac
- Time mean speed in each stroke volume
- Cardiac output
- Heart rate

Abdominal Measurement

- General abdomen
- Difficult abdomen
- Kidney
- Renal vessel
- Abdominal trauma

Small Part Measurement

- Thyroid
- Breast
- Testis
- Musculoskeletal
- Upper and lower extremity joint
- Nerve block

Vessel Measurement

- Carotid artery
- Upper artery
- Upper vein
- Lower artery
- Lower vein
- Vessel puncture
- Transcranial Doppler

Gynecology Measurement

- Uterus and Plevis
- Follicle

Urology Measurement

- Bladder
- Prostate
- Renal
- Kidney and ureter
- Pelvic Floor dysfunction

Pediatric Measurement

- Neonatal Head
- Neonatal Abdomen
- Pediatric Abdomen
- Pediatric Hip
- FAST

Obstetrics Measurement

- OB Early
- OB Mid
- OB Late
- Fetal Heart

Cardiac Measurement

- General
- LV
- MV
- Ao
- AV
- LA
- RV
- TV
- PV
- RA
- System

Auto NT (Nuchal Translucency measurement)(Optional)

- Automatically detect Nuchal Translucency in interest box
- Automatically report thickness result of NT

Auto IMT (Intima Media Thickness) measurement (Optional)

- Automatically detect intima media thickness in interest box
- Automatically report the result of IMT
- Available in linear probe

Smart 3D Volume Measurement(Optional)*

- Trace the margin of the irregular circle in different slices of volume data in irregular shape
- Automatically report the volume of the irregular object

Auto Follicle(2D/3D)(Optional) *

- Just click on the area of follicle in B mode, the area of this follicle will be reported automatically
- Report the area of different follicle in the volume data automatically



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