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: 1.09-4.18 MHz
- 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 endovagal array
- Field of view: 150 degree
- Convex radius: 10 mm
- Application: Ob/Gyn, urology
- Frequency range: 3.3-11 MHz
- 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: 4.0-12.1 MHz
- 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: 3.3-12.6 MHz
- 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 enhance 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

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: 8 steps
- 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
• VSharpen
• 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
• Triplex
• Display format
• Sweep speed
• Gray filter
• VSharpen

PW/CW mode
• New patient
• BodyPattern
• Archive
• Comments
• End exam
• Sys setting
• Probe&App
• Invert
• Triplex
• Maps
• Frequency
• PRF
• Wall filter
• Baseline
• Angle correct
• Sample volume
• Volume
• Spectrum optimize
• Acoustic power

3D mode
• Comments
• 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 filter
• Colorlevel
• Sensitivity
• Focus position
• Acoustic power
• Smooth
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
  • 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 Pelvis
• 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