ACUSON X300 Ultrasound System, Premium Edition

Release 5.0

SIEMENS

ACUSON X300 Ultrasound System
Premium Edition

GENERAL INFORMATION

The ACUSON X300™ ultrasound system, premium edition (PE) is a portable, compact, shared service imaging solution. The ACUSON X300 PE delivers exceptional clinical performance across a wide variety of applications and streamlines exam workflow with an easy-to-use ErgoDynamic™ imaging system design.

The ACUSON X300 PE combines best-in-class image quality and a robust set of features to meet daily clinical needs. It enhances diagnostic confidence with high quality 2D, 3D and 4D imaging, color and power Doppler, and steerable continuous wave and pulsed wave Doppler capabilities. It also provides a pathway to seamlessly integrate future technology advancements.

SYSTEM ARCHITECTURE

All-digital signal processing and multibeam formation technology provides best-in-class image quality in 2D and 3D imaging, Native™ tissue harmonic imaging, DTO™ Dynamic Tissue Optimization technology and Doppler modes and Dynamic TCE**™** tissue contrast enhancement technology for greater diagnostic confidence. The DIMAQ-IP integrated workstation provides digital acquisition, storage, review and transfer of ultrasound studies. Studies can be reviewed and quantified on-board, stored on the system hard drive and transferred to the built-in DVD multi-drive (DVD-R/RW & CD-R/RW) or USB Flash drive for cost-effective archival.

The all-digital system architecture enables seamless integration of optional features to:
- Enhance productivity through TGO™ tissue grayscale optimization technology, SieScape™ panoramic imaging, and Clarify™ vascular enhancement (VE) technology.

- Streamline connectivity with solutions such as DICOM Print/Store, DICOM Worklist, DICOM MPPS and DICOM structured reporting for OB/GYN, Vascular and Cardiac exams.
- Increase functionality with *four*Sight™ 4D transducer technology, Advanced *four*Sight™ technology, integrated stress echo, *four*Sight™ TEE View, *syngo*® Mitral Valve Assessment (MVA), Axius™ edge assisted Ejection Fraction, *syngo*® Auto Left Heart (Auto LH), *syngo*® Velocity Vector Imaging™ (VVI) technology, *syngo*® Arterial Health Package (AHP), *syngo*® Auto OB measurements and ACUSON AcuNav™ ultrasound catheters.

User Interface
- Intuitive Windows-based operating principles
- User-centric control panel with home-base layout and control customization
- On/Off task light and back-lit illumination of control panel
- Variable brightness indicates active state of function keys
- Customizable Soft Key selections are displayed on-screen to provide easy and immediate access to imaging controls and activation of specific functions

- Easily accessible, full size, QWERTY keyboard for text entry, function keys and system programming
- Thumbnail menu provides on-screen thumbnail images and dynamic clips during exams
- Wrist support to help reduce operator repetitive stress injuries
- Height adjustment of control panel – 100 mm up/down with lock lever
- Multi-directional articulating monitor arm to help improve ergonomics
- Arm rotation: -90 to +90 degrees
- FPD rotation: -80 to +80 degrees
- Tilt: -10 to +65 degrees
- Up: 125 mm
- Pull: 250 mm
- Wheel-lock mechanism
- Front castor (2 ea): Bi-brake system (direction lock and total lock)
- Rear castor (2 ea): total lock
- Up to 32 QuickSet™ user-programmable system parameters allows users to customize system for individual transducer/application settings. QuickSet parameters combine all preferred imaging mode parameters, annotation, text and measurements into one user preset

Language Support
- On-screen text, control panel overlay and operating instructions are all available in English, French, German, Spanish, Italian, and Chinese

Monitor
- Flat Panel Display (FPD), 15-inch color, high resolution, and progressive scan (non-interlaced) with In Plane Switching (IPS) technology
- Resolution: 1024 x 768 pixels
- Total screen area: 1024 x 768 pixels
- Recordable image area clips: 800 x 600 pixels
- Total screen capture: 1024 x 768 pixels

- Monitor tilt of 10 degrees up, 65 degrees down and swivel of -80 to +80 degrees
- Digital on-screen display of brightness and contrast controls
- Energy saving display power management
- 4 levels of illumination intensity: Off, 1, 2, 3

Audio Speakers
- High performance audio speakers are integrated in the monitor

Physiological Interface
- Standard 3-lead ECG interface
- Auxillary Input for ECG and other physiology signals from 3rd party devices
- Continuous display in all real-time modes
- R-Wave single and dual trigger function
- Respiratory trace
- Heart rate display
- Adjustable gain and trace position on screen
- Recovery Time: Less than 2 seconds

Hard Drive
- Internal 160 GB hard drive
- Allows storage of patient studies that include images, reports and measurements
- Image storage capacity up to 150,000 images with compression: color or B/W DVD Multi-Drive (DVD-R/RW & CD-R/RW)
- Removable 650 MB, 700 MB and 790 MB CD-R and 650 MB or 700 MB CD-RW
- Removable 4.7 GB single layer DVD and 8.5 GB single side double layer DVD
- Allows storage and archiving of complete patient studies including images, dynamic clips, reports and measurements
- Storage capacity dependent upon patient study size
- Export of images in TIFF and clips in AVI file or DICOM format
- DICOM viewer for export of DICOM format to CD/DVD (Vista compatible)

Transducer Ports

- Three active universal transducer ports that support high density phased array, curved array and linear array transducers
- Electronic transducer selection (instantaneous switching between transducers)
- Left-most transducer port supports TEE using MP adapter
- Industrial design provides easy access to the transducer ports

Transducer Storage

- Six configurable transducer holders support all transducer designs and provide gel bottle storage
- SuppleFlex™ transducer cables and integrated cable management for protection during exams and transport
- Special transducer holder provides secure storage and easy access to endocavity transducer
- Transducer holders can be removed for cleaning
- Optional side pocket storage for one (1) transducer connector and one (1) standard gel bottle

Acoustic Output Management

- On-screen acoustic power indicator (AIUM/NEMA output display standard)

OPERATING/DISPLAY MODES

- 2D imaging in fundamental and harmonic modes (both phase inversion and filtered)
- DTI™ Doppler tissue imaging capability
- Color M-mode
- M-mode
- Anatomical M-mode live, cineloop and DIMAQ image review
- Color Doppler velocity mode
- Power Doppler mode
- Directional power Doppler
- Pulsed Wave spectral Doppler mode (PW)
- Continuous Wave spectral Doppler mode (CW)
  - Auxiliary pencil transducer
  - Steerable CW on selected phased array transducers
- ECG trace in all modes
- Duplex mode
- Triplex mode
- Flexible combination of imaging modes in side-by-side Dual and Dual Select in real-time, and digital cine replay
- Selectable split screen display formats in 2D or 2D/color with M-mode and/or spectral Doppler mode: top-bottom or side-by-side in real-time and digital cine replay
- 4B mode allowing simultaneous display of 4 static B-mode images
- Virtual Format
- Dual from freeze
- Split/Zoom

Tissue Harmonic Imaging

Selectable harmonic frequencies increases success with difficult-to-image patients, improving diagnostic confidence, and dramatically improving contrast and spatial resolution by reducing noise and clutter in the image.

- MultiHertz™ multiple frequency imaging capability in THI
- Available on the CH5-2, C6-2, C7F2, C8-5, P8-4, P4-2, P5-1, EC9-4, EV9-4, EV9F4, P9-4, VF8-3, VF10-5, VF13-5SP, VF13-5 and V5M transducers

MultiHertz Multiple Frequency Imaging

Siemens' unique MultiHertz multiple frequency imaging is designed to combine the resolution and penetration of several transducers in one. At the push of a button, the user can independently change frequencies for 2D, THI, color and spectral Doppler to select the optimal combination for image resolution, penetration and sensitivity.

- Depending on the transducer, up to seven user selectable transmit frequencies are available

- Up to four 2D and M-mode frequencies
- Up to five THI frequencies
- Up to two frequencies in color, power or pulsed wave Doppler modes
- One frequency in SCW Doppler mode

Beamforming in 2D-mode
- New generation all-digital beamformer technology enables parallel Quad beam processing of the RF signal data in the time and amplitude domains
- 2D-mode line density up to 512 lines
- Up to 4,416 processing channels
- Total system dynamic range > 205 dB

Focusing
- Up to 4 transmit focal zones
- Digital dynamic receive focusing with dynamic apodization

SynAps Synthetic Aperture Technology
- SynAps™ synthetic aperature technology is available on the CH5-2, C8-5, VF8-3 and VF10-5 transducers for higher image resolution at depth
- User can turn SynAps technology On and Off

2D-mode Image Processing
- All-digital parallel signal processing with frame rates up to 1172 FPS – transducer dependent
- MultiHertz multiple frequency imaging with up to seven user selectable transmit frequencies
- Six levels Res/Speed selection: 0 – 5
- Five persistence levels: 0 – 4
- Four edge enhancement levels: 0 – 3
- Display dynamic range: 30 to 70 dB in five decibel increments
- Adjustable gain from 0 to 60 dB in one decibel increments
- DTO technology – 3 levels
- Dynamic TCE technology - 3 levels
- Eight DGC controls for Depth/Gain Compensation
- Nine gain balanced user-selectable gray maps

- 16 user-selectable 2D colorization maps
- Maximum Depth: 30 cm with CH5-2, P4-2 and P5-1
- Minimum Depth: 2 cm with VF13-5SP

2D Image Display
- Full screen, Curved Vector, Split, Quad and Dual Select screen formats
- L/R flip and U/D flip for all formats in real-time and digital cine replay
- Split/Zoom
- Dual image display from freeze
- Image depth from 2 cm to 30 cm in 1.0 cm increments – transducer dependent
- Virtual Format Imaging (transducer dependent)
  - Left/right steer
  - Trapezoid Imaging
- Digital read/write Zoom with image pan
  - Available on live and cine replay images
  - At least 2.5x and up to 10x zoom – transducer dependent
- 4B mode

2D Calipers – Generic Measurements and Calculations
- Multiple cursor sets on frozen, live, dual screen and cine playback images

- Up to eight distance measurements per screen
  - Distance measurement
  - Depth measurement from skin line
  - Angle measurement
  - Area and circumference: ellipse, trace
- Compound Measurements:
  - Volume: user-selectable preset by 1 distance, 2 distance, 3 distance; 1 ellipse and 1 distance
  - Flow volume: 1 velocity and 1 distance, or 1 velocity and 1 ellipse
  - Stenosis: user-selectable preset calculated by 2 ellipse, or 2 distance measurements

Pulsed Wave Spectral Doppler
- Available on all imaging array transducers
- Up to two user-selectable transmit frequencies per transducer
- DTI Doppler tissue imaging available on select transducers
- Eight sweep speed selections: 1, 2, 3, 4, 5, 6, 7, 8
- Eight selectable post-processing gray maps
- 12 user-selectable Doppler colorization maps: 0 – 11
- Adjustable gain from 0 to 90 dB in one decibel increments
- PRF range: 100 to 19,500 Hz
- Velocity scale range is $\pm 1.5 \sim \pm 350$ cm/sec with 0 degree angle correction
- Angle correction 0 - 89 degree in one degree increments
- Gate size: from 1.0 mm up to 20 mm
- Eight wall filter selections – transducer dependent
- 17 levels of baseline shift
- Spectral invert
- Autotrace function

Steerable Continuous Wave (SCW) Doppler
- Available on all phased array transducers when Advanced Cardiac-vascular option is purchased
- One transmit frequency

- Eight sweep speed selections: 1, 2, 3, 4, 5, 6, 7, 8
- Eight selectable post processing gray maps
- 12 user-selectable Doppler colorization maps: 0 – 11
- Adjustable gain from 0 dB to 90 dB in one decibel increments
- PRF range: 1.56 kHz to 34.7 kHz sample rate
- Velocity scale range is $\pm 30 \sim \pm 650$ cm/sec with 0 degree angle correction
- Eight wall filter selections – transducer dependent
- 17 levels of baseline shift
- Spectral invert
- Autotrace function is not supported in SCW Doppler mode

Spectral Doppler Display
- Full screen Doppler trace, 2D/Doppler mode, triplex or update 2D/C/Doppler
- Four imaging display formats – top-bottom: 1/3-2/3, 1/2-1/2, 2/3-1/3; side-by-side: 40-60

Spectral Doppler Calipers – Generic Measurements and Calculations
- Multiple cursor sets on frozen and cine playback images
- Velocity/Frequency/Pressure Gradient
- Heart rate/Heart cycle/Time
- Autotrace measurements and calculations including PS, ED, TAMx, TAMn, PI, RI and S/D
- Resistive Index (RI)
- Pulsatility Index (PI), including Peak-to-Peak method
- Time Average Velocity max (TAV)
- Systolic/diastolic ratio (S/D)
- Velocity Time Integral (VTI)
- Acceleration/Deceleration
- Flow volume using combined velocity and distance, or velocity and ellipse measurements
- Doppler angle correction after measurement

Color Doppler Velocity Imaging
- Available on all imaging array transducers
- MultiBeam Formation technology provides quad signal processing for color Doppler frame rates up to 171 fps – transducer dependent
- DTI capability imaging available on select transducers
- Left/right steer on all linear transducers
- Advanced processing in color Doppler mode resulting in excellent spatial resolution and superior Flash suppression
- Up to two user-selectable transmit frequencies per transducer
- Up to nine user-selectable color Doppler velocity maps (seven velocity and two velocity/variance)
- Velocity scale range: ±0.6~±244.4 cm/sec
- PRF scale range: 100 Hz to 19,500 Hz — transducer dependent
- Adjustable gain from -20 dB to 20 dB in one decibel increments
- Six color Doppler line density selections
- Four wall filter selections
- Four levels of color smoothing
- Five tissue/color priority selections
- Five color Doppler persistence levels
- Color Doppler invert
- Velocity tag
- Peak hold: Off, 1 sec, 2 sec, and 3 sec
- AutoColor flow state optimization with high, medium and low flow settings

Power Doppler Imaging
- Available on all imaging array transducers
- MultiBeam Formation technology provides quad signal processing for power Doppler frame rates up to 170 fps – transducer dependent
- Left/right steer on all linear array transducers

- Up to two user-selectable transmit frequencies per transducer
- Up to 16 power Doppler maps (eight directional and eight non-directional)
- PRF scale range: 100 Hz to 19,500 Hz — transducer dependent
- Gain: -20 dB to 20 dB in one decibel increments
- Six power Doppler line density selections
- Four wall filter selections
- Four levels of power Doppler smoothing
- Five tissue/power Doppler priority selections
- Five color persistence levels

Color and Power Doppler Display
- 2D/C mode, Split 2D-2D/C mode
- Dual real-time 2D/C mode
- 2D/C/D mode (simultaneous triplex), 2D/C/D mode (update)

M-mode
- Available on all imaging array transducers
- Anatomical M-mode – live, cineloop and DIMAQ image review
- Up to five user-selectable frequencies, including fundamental and harmonics
- Four edge enhancement selections
- Display dynamic range: 30 dB to 70 dB in five decibel increments
- Adjustable gain from 0 dB to 60 dB in one decibel increments
- Nine user-selectable gray maps
- 16 user-selectable M-mode colorization maps
- Eight sweep speed selections: 1, 2, 3, 4, 5, 6, 7, 8

M-mode Image Display
- Full screen M-mode, 2D/M-mode
- Four imaging display formats – top-bottom: 1/3-2/3, 1/2-1/2, 2/3-1/3; side-by-side: 40-60

M-mode Calipers – Generic Measurements and Calculations
- Multiple cursor sets on frozen and cine play back images
  - Distance
  - Time
  - Slope
  - Heart rate

FREEZE, CINE AND CINE POST-PROCESSING FUNCTIONS

Cine Review
Cine feature is standard and offers post-acquisition optimization of all real-time post-processing functions.
- Frame-by-frame cineloop review and continuous cine motion review, including control of playback rate
- Independent cine review in mixed modes (2D/M, 2D/Doppler, 2D/C/Doppler)
- Independent cine review in 2D Dual Select mode with image align playback feature
- Maximum standard cine memory is up to 2729 frames
- Acoustic clip capture from cine review
- Retrospective clip capture during real-time imaging with a selectable duration of 1, 2, 3, or 4 seconds or a selectable duration 1, 2, 3 or 4 beat capture; ECG triggerable
- Prospective clip capture during real-time imaging with a selectable duration of 1 to 120 seconds a selectable duration 1 to 120 beat capture; ECG triggerable
- Anatomical M-mode – live, cineloop and DIMAQ image review

Post Processing Features in Freeze Frame or Cine
- D-mode
  - Zoom/pan
  - Gray map
  - 2D-mode colorization map
  - Measurements/reports/annotations/pictograms
- Color Doppler
  - Zoom/pan
  - Color map
  - Color invert
  - Measurements/reports/annotations/pictograms
- Spectral Doppler
  - Gray map
  - Doppler colorization map
  - Angle correct
  - Measurements/reports/annotations/pictograms
- M-mode
  - Gray map
  - M-mode colorization map
  - Measurements/reports/annotations/pictograms

TRANSDUCER TECHNOLOGY

Ultra-sensitive, wideband transducers, matched with user-selectable MultiHertz imaging, improve resolution and penetration. Depending on the transducer, the user can select from up to seven 2D and THI frequencies and up to two color Doppler and spectral Doppler frequencies, expanding the clinical versatility of a single transducer, and thereby

maximizing transducer investment.
- Wideband MultiHertz imaging allows user selection of independent 2D and color frequencies for optimal resolution and penetration
- Universal, stainless steel and disposable biopsy guides for specified linear and curved array transducers
- Innovative ultra low-loss lens materials and microelectronic technologies for efficient performance and increased signal bandwidth
- Frequency range: 1.2 MHz to 13 MHz
- Hanafy Lens acoustic technology
- Single crystal piezoelectric design
- microCase™ transducer miniaturization technology and SuppleFlex cables

Intracardiac Echocardiography Transducers
- ACUSON AcuNav 10F ultrasound catheter – Adult intracardiac echocardiography
- ACUSON AcuNav 8F ultrasound catheter – Adult intracardiac echocardiography
- CartoSound™ Communication- Adult intracardiac echocardiography

Note: See dedicated transducer flyer for more information.

STUDY TYPES

The ACUSON X300 PE is designed to support most multi-specialty imaging applications. Factory supplied exam and transducer dependent imaging presets have been carefully optimized for each application to provide consistency, reliability, and increased productivity. Selected applications include body markers, text and annotation labels, worksheets and reports.
- Abdominal
- Renal
- Obstetrics

- Gynecology
- Early Obstetrics
- Adult Cardiac (Transthoracic)
- Pediatric Cardiac (Transthoracic)
- Neonatal Echo
- TEE Adult
- Intacardiac Echo (ICE)
- Vascular (C-Vas, P-Vas, Venous)
- Small Parts (Breast, Testicle, Thyroid)
- Orthopedics
- Musculoskeletal
- Urology (Prostate)
- Cranial (TCI)
- Emergency Medicine (EM)
- Penile

EXAM-SPECIFIC MEASUREMENTS AND REPORTS

The measurement function is arranged by exam type and is available for use with all exam types. The ACUSON X300 PE and has measurement and report packages for the following exam types:
Abdomen
- All general measurements and calculations
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Obstetrics
- All general measurements and calculations
- Early Obstetrics Menstrual Age (MA) measurements are MSD, CRL, and Yolk Sac
- Menstrual Age parameter labels are MSD, CRL, BPD, OFD, HC, AC, ATD, ASD, FL, HL, UL, TL, FT, FTA, and BN
- Five user-defined labels are available in 2D-mode
- Calculations include: EFW from the selected

reference, HC/AC, TCD/AC, LVW/HW, CorBPD, FL/AC, FL/BPD, CI, AFI, AXT, and Fetal Heart
- Face Angle
- Customizable Anatomy Descriptions
- Calculations for both Gestational Age (GA), ultrasound menstrual age, and Estimated Date of Confinement (EDC)
- Early OB and Standard OB patient reports include worksheets for viewing the progress of the report and editing during the exam process
- Multiple fetus reporting capabilities
- Growth Analysis Graphs with exam file linking
- OB patient report and worksheet including Fetal Heart report page
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Gynecology
- All general measurements and calculations
- Micturated and residual volume calculation
- Uterus and right and left follicle ovary measurements
- Gynecology patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Cardiac
- Adult and pediatric standard measurements
- Volume formulas for Left Ventricular function assessment in 2D-mode and M-mode
- 2D-mode, M-mode, and Doppler calculations
- M-mode Slope, Heart Rate, Time, and Distance measurements
- Spectral Doppler Acceleration, Trace, Heart Rate, Time and Velocity measurements

- Cardiac patient report and worksheet for 2D-mode, M-mode, and Spectral Doppler
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Cerebrovascular
- All general measurements and calculations
- ICA prox, ICA mid, ICA dist, ECA and VA measurements
- Area Percent Stenosis and Diameter Percent Stenosis measurements
- Cerebrovascular patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Peripheral Vascular
- All general measurements and calculations
- CIA, EIA, CFA, PFA, SFA prox, SFA mid, SFA dist, POP A, TRUNK ATA, PTA, PER A and DPA measurements
- Right and left extremity measurements
- Peripheral vascular patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Venous
- All general measurements and calculations
- Right and left extremity measurements
- Venous patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Thyroid
- All general measurements and calculations
- Thyroid volume
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Urology
- All general measurements and calculations
- Residual volume calculations
- Prostate and urology patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Testicle
- All general measurements and calculations
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Musculoskeletal
- All general measurements and calculations
- Right and left hip angle measurement
- Classification and Graf Sonometer
- Hip angle patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

TCI
- All general measurements and calculations
- MCA, ICA-Siphon, ACA-A1, ACA-A2, ACoA, PCA-P1, PCA-P2, PCoA, PCA, Basilar A and Vert A measurement

- TCI patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Penile
- All general measurements and calculations
- Corp Cav, Corp Spong, Cav A, Pre-Inj Cav A, Post-Inj Cav A and Urethra B mode measurement
- Iliac A, Dorsal A, Urethral A, Bulbar A, Brach A, Cav A, Pre-Inj Cav A, Post-Inj Cav A, Sup Dorsal V and Dp Penile V D mode measurement
- Penile patient report
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line

Emergency Medicine Calculations
- FAST – Focused Acute Sonography in Trauma reporting elements to support emergency medicine utility
- Aorta – essential aorta measurements and reporting elements to support emergency medicine clinical utility

- OB – subset of essential OB measurements and reporting elements to support emergency medicine clinical utility
- Physician summary utility – supports on-system report generation including customizable letterhead, patient data, results, graphs, images, comments, recommendations, and customizable signature line
  - The ACUSON X300 PE supports customizable labeled measurements (20 B-mode, 5 Doppler & 5 M-mode) for the following exam types: Abdomen, Muskuloskeletal, Breast, Thyroid, Testicle,Venous, Renal, Pedatric Abdomen, Neonatal Head, Superficial Muskuloskeletal, Digital, Small Parts and Aorta.

DIGITAL PATIENT STUDY STORAGE AND ARCHIVING

The DIMAQ-IP integrated workstation allows for digital acquisition, storage and review of complete ultrasound studies, including static images and dynamic clips, measurements, calculations and reports.

Patient Study Management
Playback of digitally stored images in a selectable 1-up, 4-up, 9-up, 16-up or 25-up screen format. The patient study screen allows searching, selecting and deleting studies, and exporting studies to DVD multi-drive (DVD-R/RW and CD-R/RW)
- 100 GB internal hard drive reserved for patient data management
- Compatible with removable 650 MB, 700 MB and 790 MB CD-R and 650 MB or 700 MB CD-RW
- Removable 4.7 GB single layer DVD and 8.5 GB single side double layer DVD
- Hard drive capacity:
  - Approximately 150,000 B/W and color images
- Storage and retrieval of frozen static images

- Storage and retrieval of reports
- Instant dial-in and replay of static images in 1-up screen format
- Supports measurements and calculations on archived study and on saved and retrieved images
- Acoustic clip capture from cine review
- Retrospective clip capture during real-time imaging with a selectable duration of 1, 2, 3 or 4 seconds or a selectable duration of 1, 2, 3 or 4 beat capture; ECG triggerable
- Prospective clip capture during real-time imaging with a selectable duration of 1 to 120 seconds or a selectable duration of 1 to 120 beat capture; ECG triggerable
- Export of patient studies from hard drive to DVD-R/RW and CD-R/RW drive. Studies can be individually selected or batched copied
- Images are exported in PC compatible TIFF format, AVI format, or DICOM format
- M-mode still frame scroll and store
- PW spectral Doppler still frame scroll and store
- Patient database sorting by Name, ID, and study date
- USB flash drive

OPTIONS

PLUS (Option)
The Plus Option is a beamforming hardware option that improves image quality, penetration and sensitivity for high density transducers on the ACUSON X300 PE. The following transducers deliver enhanced performance with installation of the Plus Option: C7F2, EV9F4, C6-2, CH5-2, VF8-3, VF10-5, C8-5.

Dynamic TCE Technology (Option)
Dynamic TCE technology is an advanced post processing method for speckle reduction and edge enhancement. Three levels available: low, medium and high.

Integrated Gel Warmer (Option)
- Enables gel warming
- Temperature control precision: ±1°
  - Low: 31° C
  - Medium: 34° C
  - High: 37° C
- Easy-to-use Power on/off control switch
- LED color for status indicator:
  - Standby mode: Off
  - Operating mode: Orange
- Saftey protection for electrical overload
- Weight: approximately 385g
- Size: 87 x 170 x 85 (mm)

DICOM 3.0 Connectivity (Option)
Enables digital data transfer via a DICOM network for both printing and storage. The ACUSON X300 PE acts as a DICOM Storage Class User and DICOM Print Class User.

Functionality supported:
- Connectivity to PACS system for storage of all digital images and dynamic clips with patient demographic data
- In-Progress Store during the exam
- Image printing to DICOM color and grayscale printers
- DICOM Storage Commitment
- DICOM Exchange Media export to DVD-R/RW and CD-R/RW
- DICOM Region Calibration
- DICOM interchange media viewer software SHOWCASE®
- Interchange media database that identifies the CD to which the patient study has been burned

DICOM Modality Worklist (Option)
Enables query and direct download of the patient worklist schedule from the Hospital/Radiology Information System (HIS/RIS) to the ACUSON X300 PE, automatically populating the "New Patient" screen with patient demographic information. (Requires DICOM 3.0 Connectivity option.)

DICOM MPPS–Modality Performed Procedure Step (Option)
Enables automatic exchange of Modality Performed Procedure Step information with the Hospital/Radiology Information System (HIS/RIS). (Requires DICOM 3.0 Connectivity option and DICOM Modality Worklist option.)

DICOM OB/GYN Structured Reporting (Option)
DICOM Structured Reporting (SR) provides a standardized report architecture to allow for easy transfer of OB and GYN measurements to offline PCs, workstations and archiving systems. DICOM OB/GYN Structured Reporting will automatically populate OB/GYN measurements to their respective fields in an external software package. (To send the OB/GYN SR data over the network, the DICOM 3.0 connectivity option is required.)

DICOM Vascular Structured Reporting (Option)
DICOM Structured Reporting (SR) provides a standardized report architecture to allow for easy transfer of Vascular measurements to offline PCs, workstations and archiving systems. DICOM Vascular Structured Reporting will automatically populate Vascular measurements to their respective fields in an external software package. (To send the Vascular SR data over the network, the DICOM 3.0 connectivity option is required.)

DICOM Cardiac Structured Reporting (Option)
DICOM Structured Reporting (SR) provides a standardized report architecture to allow for easy

transfer of Cardiac measurements to offline PCs, workstations and archiving systems. DICOM Cardiac Structured Reporting will automatically populate Cardiac measurements to their respective fields in an external software package. (To send the Cardiac SR data over the network, the DICOM 3.0 connectivity option is required.)

QuikStart (Option)
QuikStart reduces time required for power-up and power-down events by allowing the system to enter a specialized suspend mode.
- Standby mode power-down in 3 sec; complete boot-up in less than 12 sec
- Standby time: more than 40 min
- Full recharge in less than 180 min

Tissue Grayscale Optimization (TGO) (Option)
TGO tissue grayscale optimization technology provides one-button image optimization. It automatically adjusts image brightness to the tissue type being imaged and equalizes the overall image gain. The user-definable threshold accommodates different user preferences for gain settings and various room lighting conditions. TGO technology improves the consistency and quality of the ultrasound images to enhance productivity by removing time-consuming and operator dependent manual adjustments. TGO technology can be used with every transducer, for every exam type and at every imaging frequency, including THI.

*four*Sight 4D transducer technology (Option)
*four*Sight 4D technology provides 2D and 3D imaging utilizing mechanical acquisition, as well as real-time 4D imaging, up to 30 volumes per second, with the C7F2 and the EV9F4 4D transducers. The *four*Sight 4D imaging option offers an easy-to-use interface for rapid acquisition and volume rendering and includes the following:

- Curved VOI
- 4D cine
- MPR Measurements
- 3-Scape™ real-time 3D imaging is supported on the following transducers: CH5-2, C6-2, EV9-4

Advanced *four*Sight technology (Option)
Advanced *four*Sight technology offers broad 3D/4D acquisition, data rendering and post-processing functionality.
- MultiSlice format allows the user to select range, slice spacing and format for viewing each slice. The MultiSlice format supports up to 36 slices at once.
- Thick Slice Imaging (TSI) enables definition of a view plane and creates a thick slice around the region of interest. TSI delivers improved contrast resolution and provides more information in a single image.
- Curved MPR enables real-time multiplanar reformatting of images into any linear or curved plane. This permits the user to set points along a curved object in order to bring all objects along this line into the same plane for viewing, such as the fetal spine.

Advanced Cardiac-vascular (Option)
Contains the prerequisites to perform cardiac and certain vascular exams:
- Physiological interface
  - Standard 3-lead ECG interface
  - Aux ECG interface
  - R-Wave single and dual trigger function
  - Heart rate display
  - Adjustable gain and trace position on screen
  - Selection for external ECG input
  - Respiratory function
- Steerable Continuous Wave Doppler module
- Auxiliary Continuous Wave Doppler module

Spectral and Color Doppler Tissue Imaging (DTI) (Option)

- Provides color DTI and spectral DTI exams with quantification package
- Spectral DTI with quantification package
- Enables assessment of LV diastolic function on the ACUSON X300 PE
  - Spectral Doppler DTI capability utilizes real-time Doppler shift information from moving tissue to better visualize and quantify myocardial diastolic function
  - The spectral Doppler DTI calculation package provides guided velocity and acceleration measurements and includes a measurement report package
  - Color DTI capability can be used for qualitative evaluation of wall motion and displays the relative change of velocities
  - Color DTI M-mode
  - DTE(Doppler Tissue Engery)

SieClear multi-view spatial compounding (Option)

The SieClear compounding option increases contrast resolution and improves tissue differentiation of low contrast lesions by reducing image speckle. Tissue boundaries and interfaces appear sharper and more continuous. SieClear compounding is accessible in THI and is compatible with other advanced imaging options including SieScape panoramic imaging, TGO ultrasound technology and Clarify VE technology.

Clarify vascular enhancement (VE) technology (Option)

Clarify VE technology is a real-time, adaptive, pixel-by-pixel analysis implemented through a simple, time-saving user interface that provides multiple levels of clarification to optimize tissue contrast resolution and definition of both tissue and vessel walls according to user preference. Clarify VE technology is available on all curved and linear transducers.

SieScape Imaging (Option)

B/W panoramic imaging allows acquisition and display of images up to 60 cm in length to a maximum curvature of 360 degrees.

- Available on all curved and linear transducers
- Can be displayed in full length or zoomed for detailed viewing
- Measurements available

Advanced Physio Module (Option)

The Physio Module provides the ability to configure ECG capabilities for specialty applications that do not require continuous wave Doppler capabilities. Aux ECG and Respiratory function are supported in addition to conventional Physio Module.

OPTIONAL APPLICATIONS

CartoSound Communication (Option)

This license enables Ethernet communication between the ACUSON X300 ultrasound system, premium edition and the Biosense Webster CARTOSOUND™ system.

syngo Auto OB Measurements (Option)

syngo Auto OB measurements is an innovative algorithm which provides the ability to auto-measure major fetal structures required for biometric measurements: BPD, HC, OFD, AC, FL and HL. This technology reduces user variance when performing these measurements. The measurement results are saved to the report.

Stress Echo Package (Option)

The stress echo package provides tools for ECG triggered acquisition, display, selection, comparison, evaluation and archiving of multiple cardiac loops during various stages of a stress echo examination.

- Standard acquisition protocols for treadmill, ergometric, and pharmacological stress including:
  - Multiple factory default stress echo protocols
  - Customizable stress echo protocols
  - Flexible combination of imaging modes while in the stress echo package
  - Ability for customized studies through Protocol Editor, with up to 12 stages, 6 views per stage, 20 loops per view or 120 second prospective clip capture
- Full screen or ROI (region of interest) acquisition
- Complete R-R capture with clip editing
- Easy workflow throughout the exam protocol
- Stage Timer
- Prospective continuous capture (up to 120 seconds) or Retrospective labeled capture
- Reference image display during acquisition
- Immediate review of acquired loops
- Flexibility to skip views or stages
- Flexibility to re-acquire and overwrite already acquired images
- Indication of current view, acquired views and skipped views in the workflow diagram
- Wall Motion Scoring, 16/17 segment model with graphical display and report printing
- LV Volume Measurements with report printing

syngo fourSight TEE View (Option)
An integrated method which provides acquisition, review, manipulation and dynamic display capabilities of gated 3D datasets using the V5M transesophageal transducer.
- 3D surface (volume) rendering for detailed anatomical display

- D'Art is an intuituve navigation tool with adjustable indicator for line of sight direction
- Utilizes two cut planes positioned perpendicular to the selected line of site
- Dynamic MultiPlanar reconstruction
- Viewing presentation enhanced by zoom, pan and rotate functions
- Easy to use, rapid acquisition, enhanced workflow

syngo Mitral Valve Assessment (MVA) (Option)
An integrated method which, in conjunction with syngo fourSight TEE view, enables a detailed assessment of mitral valve morphology from 3D images for a more accurate and complete diagnosis of pathology location and size. Performs measurements for:
- Angle
- Size
- Distance
- Area

syngo Arterial Health Package
syngo® Arterial Health Package software (AHP) provides the clinician with the capability to measure Intima Media Thickness and the option to reference normative tables that have been validated and published in peer-reviewed studies. The information is intended to provide a straightforward tool for communicating with patients the relative state of their cardiovascular system. This feature should be utilized according to the ASE Consensus Statement, "Use of Carotid Ultrasound to Identify Subclinical Vascular Disease and Evaluate Cardiovascular Disease Risk: A Consensus Statement from the American Association of Echocardiography; Carotid Intima-Media Thickness Task Force, Endorsed by the Society for Vascular Medicine".

[1] ARIC - G Howard, et al: "Carotid artery intimal-media thickness distribution in general populations as evaluated by B-mode ultrasound, ARIC Investigators": Stroke 1993;24;1297-1304

syngo Velocity Vector Imaging (VVI) Technology (Option)

A dynamic 2D method to visualize, measure, and display global and regional myocardial motion and mechanics. Available both on and off the system.

- Uses grayscale images and a sophisticated tracking algorithm to determine the velocity and direction of myocardial tissue motion and displays it in a dynamic vector presentation overlapping the 2D clip
- Base of vectors tract tissue motion
- Length of vector indicates how fast the tissue at the base of the vector is moving
- Direction of vectors point in the direction of tissue motion
- Algorithm allows for processing ultrasound clips obtained in all views of the heart, as well as for generic moving tissue (e.g., vessel wall)
- Not limited by color Doppler dependencies of frame rate, angle or mean velocities
- Compatible with all transducers
- The tracking algorithm for _syngo_ VVI incorporates multiple sources of information, including speckle tracking:
  - Manual tracing of the myocardial border on any single frame of a clip
  - Mitral plane motion tracking
  - Tracking of the inward and outward motion of the tissue border
  - Tissue motion along the border trace using sophisticated speckle tracking
  - Periodic motion of the heart
  - Spatial coherence of tissue motion
- Parameters and parametric displays supported by _syngo_ VVI include:
  - Visual assessment of wall tracking
  - Visual assessment of vector dynamics
  - Display of time curves of the selected velocity vector components
  - ECG display
  - Individual heartbeat, or average of multiple heart beats analysis

- Parametric color M-mode display of a selected component of Tissue Velocity along the dynamic tissue border trace over time
- Parametric color M-mode display of Tissue Strain along the dynamic tissue border trace over time
- Up to 20 different points can be selected on the 2D image along the trace for graphic displays of Velocity, Strain and Strain Rate. Combined display or full-screen magnification
- 3D representations of parametric color M-mode display along the trace over time for:
  - Selected components of Tissue Velocity
  - Tissue Strain
  - Tissue Strain Rate
  - Pan, Zoom, Rotate of the 3D parametric display
- Time curves of global and segmental (6-segment model) LV volumes automatically calculated by Simpson method
- Parametric color display of automatically calculated global and segmental Ejection Fraction
- Time curves and measurements of Dmin (transverse diameter) and Dmax (longitudinal diameter)
- Simultaneous display of volume time curves and measurements for current and previous cases
- Synchrony analysis
  - 6-segment chamber model
  - Time curve display and measurements for segmental tissue motion parameters: Velocity (tangential or radial), Strain (tangential or radial), Strain Rate (tangential or radial) and Displacement (tangential or radial)
  - Automatic time-to-peak and phase analysis of all motion parameter curves
  - Parametric color 6-segment model display of Time-to-Peak and phase information for Velocity (tangential or radial), Strain (tangential or radial), Strain Rate (tangential or radial), Displacement (tangential or radial) and Rotation

- An arbitrary, multi-segment M-line can be selected on a 2D clip display to obtain virtual M-mode information derived from a 2D clip. Virtual M-mode can be used as a background for time curves providing reference on cardiac cycle phase
- Compatible with standard acquisition frame rate clips, and acoustic clip capture (e.g., iso-volumetric contraction and relaxation events)

syngo Auto Left Heart (Auto LH) Technology (Option)
- Calculated Confidence
  - Uses pattern recognition technology based on a comprehensive database representing typical adult transthoracic exams
  - Provides robust performance and expert-like consistency in every exam
  - Excels in technically difficult studies as learning is largely independent of image quality
- Automated Workflow
  - Bypasses the cumbersome "mark-and-trace" method to calculate EF, end diastole volume and end systole volume
  - Automatically identifies ED and ES frames and tracks endocardial borders frame to frame
  - Promotes smooth, efficient workflow with manual edit options
  - Reduces observer variability to yield more consistent, standardized measurements
- Consistent, Reliable and Convenient
  - Extends calculation accuracy to broaden clinical confidence
  - Presents EF measurement in complete perspective — with image frames for ED and ES with numerical and graphical data
  - Available off the system with _syngo_® US Workplace
  - Operates on DICOM clips from select Siemens and non-Siemens ultrasound systems

Axius Edge Assisted Ejection Fraction (Option)
Axius ejection fraction calculates left ventricle volumes and ejection fractions quickly and reliably.
- Enhances workflow by allowing the user to indicate three boundary points for measurement instead of a manual trace of the ventricle
- Utilizes the Simpson method for LV volume calculations based on LV endocardial border trace

Intracardiac Echocardiography Imaging Options (ICE)
Adult and pediatric intracardiac echocardiography (ICE) using the ACUSON AcuNav ultrasound catheter family.
- Disposable ACUSON AcuNav 8F ultrasound catheter
  - 8 french catheter (cross-sectional diameter 3.3 mm), 110 cm insertable length
- Disposable ACUSON AcuNav 10F ultrasound catheter
  - 10 french catheter (cross-sectional diameter 2.7 mm), 90 cm insertable length
- Ultrasound catheters must be purchased separately
- Reuseable SwiftLink™ catheter connector (DL-260 type) (additional SwiftLink connectors are optional)
- 10 sterile covers
- Complete echocardiography exam capabilities during intracardiac minimally invasive procedures, such as atrial fibrillation ablation, transcatheter septal closure device placement, pacemaker lead placement, transseptal catheterization, and balloon valvuloplasty or septostomy
- Visualization of cardiac anatomy and regional myocardial tissue motion, great vessels and vascular anatomy, blood flow direction and velocity, other devices located within the heart
- Sterile, steerable, single-use catheter

- High resolution, high frame rate imaging in multiple modes, including: 2D, M-mode, PW spectral Doppler, CW spectral Doppler, color Doppler velocity and Doppler tissue imaging (optional)
- Digital phased array technology – not mechanical scanning
- Imaging penetration up to 15 cm allows for visualization of left-sided cardiac anatomy from within the right atrium or right ventricle
- Two planes of bi-directional steering of the catheter tip (160 degrees in each direction: anterior-posterior/left right) for maneuverability, rapid anatomic orientation and micro-positioning
- Longitudinal side-fire imaging provides standard echocardiographic views, similar to TEE, for easier orientation
- QuikSet user-programmable system parameters provide instant image optimization
- Tension control knob for holding the desired catheter curvature
- 64-element digital phased array with simultaneous processing for the highest imaging resolution in all modes
- Access to advanced imaging modes provides full echocardiography capabilities, including:
  - 2D imaging
  - M-mode
  - Pulsed Wave (PW) spectral Doppler
  - Continuous Wave (CW) spectral Doppler
  - Color Doppler velocity capability
  - DTI Doppler Tissue Imaging capability (optional)
  - Comprehensive measurements and calculation, including volume, function and hemodynamics
- MultiHertz imaging
- Zoom capabilities

DOCUMENTATION DEVICES

Optional On-Board Video Devices
- Up to two (B/W printer and color printer/DVD Recorder) documentation devices can be integrated into the system cart and controlled from the system control panel
- Supported devices:
  - Mitsubishi USB P93DW/P95 B/W Printer
  - Mitsubishi USB CP30DW Color Printer
  - Sony USB UP-23MD Color Printer
  - JVC DVD BD-X201MS Recorder (NTSC/PAL switchable, 115V/230V)
  - Mitsubishi S-VHS VCR (NTSC and PAL versions)

SYSTEM INPUT/OUTPUT

Video Standard
- PAL/CCIR: 625 lines, 50 Hz
- NTSC/EIA: 525 lines, 60 Hz

Video/Audio Input
- (1) Composite color Video in, BNC-type
- (1) Y/C Video in, S-terminal (SVHS)
- (1) 2-Channel Audio in (Right/Left), RCA -- jack type

Video/Audio Output
- (1) Composite B/W Video out, BNC-type
- (1) Composite color Video out, BNC-type
- (1) RGB and Composite Sync out, mini D-SUB (15 pin)
- (1) Y/C Video out, S-terminal (SVHS)
- (1) 2-Channel Audio (Right/Left), RCA jack type
- (1) VGA out, mini D-SUB (15pin)

Other Input/Output
- (1) Foot switch connector, phone jack-type
- (1) Remote control connector, mini-jack (stereo)

System Interface Connections
- Network
  - (1) Ethernet connector, type RJ45 (10/100 BaseT)
- Peripherals
  - (2) Serial port RS-232C connector, D-SUB (9-pin)
  - (2) USB 2.0 ports
  - (2) AC Main Outlet

SYSTEM DIMENSIONS

- Height: 137.9 – 166 cm (54.43 – 65.3 in)
- Width: 51.8 cm (20.4 in)
- Depth: 87.9 cm (34.6 in)
- Weight: 102 kg (225 lbs)/98 kg without OEM's

ELECTRICAL/ENVIRONMENTAL SPECIFICATIONS

The ACUSON X300 PE is available in one mainframe configuration, suitable for use in 100/115V and 230V environments.

- Power connections: 100-120/200-240 VAC, 50/60Hz
- Built-in AC isolation transformer
- Power consumption: maximum 600VA with OEM's
- Atmospheric pressure range: 700 hPa to 1060 hPa (525 to 795 mm Hg) or up to 3050 m (10,000 ft)
- Ambient temperature range (without OEM's): 10°C to +40°C (50° to 104°F)
- Humidity: 30 – 80%, non-condensing, during operation
- Maximum heat output: 2150 BTU/hr

INTEGRATING THE HEALTHCARE ENTERPRISE (IHE)

Having all relevant information at one's fingertips is a prerequisite for optimal and efficient patient care. Seamless integration of the hospital's IT and Imaging Systems and their capabilities to exchange information without restriction are key success factors for facilitating daily work. This is why Siemens has been instrumental in launching and advancing the IHE (Integrating the Healthcare Enterprise) Initiative. Our commitment and dedication enable us to provide clinicians with the ACUSON X300 PE one of many innovative products embedded with the building blocks necessary in supporting clinicians' need for seamless health information exchange.

For more information on the ACUSON X300 PE and the Siemens commitment to the IHE initiative, please visit www.siemens.com/IHE.

STANDARDS COMPLIANCE

The ACUSON X300 PE meets the requirements of the Medical Device Directive and carries the CE Mark.

Quality Standards
ISO 9001:
ISO 13485:2003 / EN ISO 13485:

Design Standards
UL 60601-1
CSA C22.2 No. 601-1
EN 60601-1 and IEC 60601-1
EN 60601-1-1 and IEC 60601-1-1
EN 60601-1-2 and IEC 60601-1-2
EN 60601-2-37 and IEC60601-2-37

Acoustic Output Standards
- IEC 61157 (Declaration of Acoustic Power)
- AIUM/NEMA UD-2, 1998 Acoustic OutputMeasurement Standard for Diagnostic Ultrasound
- AIUM/NEMA UD-3, 1998 Standard for Real-TimeDisplay of Thermal and Mechanical Acoustic Output Indices on Diagnostic Ultrasound Equipment

CE Declaration

The 230V/115 V version of the ACUSON X300 ultra-sound system, PE is provided with a CE marking in accordance with the regulations stated in Council Directive 93/42/EEC of June 14, 1993 concerning Medical Devices. Siemens Medical Solutions USA, Inc., is certified by notified body 0123 to Annex 11.3 – Full Quality System.

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Siemens reserves the right to modify the design and specifications contained herein without pri-ornotice.

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