High Definition ultrasound made simple

Philips HD11 XE ultrasound system specifications

- Extremely versatile platform, built for High Definition performance with broadband beamforming, supercomputed signal processing and clinically-proven SonoCT and XRES imaging technologies
- Clinical applications packages covering Cardiology, General Imaging, Vascular and Ob/Gyn
  - Packages include presets for common exam types, plus exam-specific calculations and analysis, configurable patient reports and support for biopsy procedures
- Create single specialty or multi-specialty configurations
- Add advanced performance options as needed, including quantitative 3D/4D, 3D Fetal Echo STIC, Stress Echo, Panoramic and Contrast imaging
- Protect your investment with award-winning customer service

PHILIPS

System Specifications

System Specifications

Applications

- Abdominal
- Small parts and superficial
- Pediatric
- Musculoskeletal
- Obstetrical
- Gynecological and fertility
- Prostate
- Vascular
  - Cerebrovascular
  - Peripheral vascular
  - Intraoperative vascular
- Transcranial Doppler
- Cardiac
  - Adult
  - Pediatric
  - Transesophageal
  - Stress
- Contrast imaging
- ICE Imaging (Intracardiac Echocardiography)

Imaging Modes

- 2D grayscale imaging with advanced Fusion frequency compounding technology
- Tissue Harmonic Imaging with Pulse Inversion technology
- SonoCT beam-steered real-time compound imaging
- Harmonic SonoCT imaging
- XRES adaptive image processing technology
- iSCAN intelligent scanning for one-button TGC, gain and compression map optimization
- Simultaneous 2D and M-mode
- Color M-mode
- Anatomical M-mode
  - Trace can be generated or modified post-Freeze, from 2D image data in Quick Review buffer
- Adaptive Color Doppler for automatic selection of optimal color frequency
- Color Tissue Doppler Imaging
- Pulsed wave Tissue Doppler Imaging
- Color Power Angio Imaging (CPA) and directional CPA
- Intelligent Doppler for maintaining specified scanning angles during flow adjustments
- Adaptive Doppler for boosting weak signals and reducing noise
- Duplex 2D/PW Doppler
- High-PRF pulsed wave (PW) Doppler
- Color compare
  - Real-time color/2D images
- Triplex 2D, CPA, PW Doppler
- Dual imaging with:
  - Independent cineloop buffers
  - Mixed mode display with one image live while other is frozen, for example 2D/2D, 2D/color, color/color, color/CPA
- High Definition zoom (write zoom)
- Reconstructed zoom with pan (read zoom)
- Panoramic imaging
- Trapezoidal imaging
- Freehand 3D and MPR imaging
- Automated 3D and real-time 4D imaging with harmonics and color modes
- Automated 3D fetal echo STIC (Spatio-Temporal Image Correlation)
- Chroma imaging in 2D, 3D, 4D, MPR, panoramic, M-mode, Doppler modes and CW/PW
- Contrast imaging

Gray Shades

- 256 (8 bits) in 2D, M-mode and Doppler spectral analysis

Acquisition Frame Rate

- 2D frame rate acquisition greater than 785 frames per second (dependent on transducer, field of view, depth and angle)
- Color frame rate acquisition greater than 320 Hz (dependent on transducer, field of view, depth and angle)

The automated volume transducers are lightweight and small with an ergonomic design for improved user comfort during exams. The C6-3 smaller curved array transducer improves intercostal access. The new BP10-5ec transducer supports biplane prostate imaging.

Transducers

Transducer Selection

- Electronic switching of transducers using up to five connector ports
- Dedicated (Pedoff) CW and PW Doppler connector
- User customizable imaging presets for each transducer
- Multiple user-selectable transmit focal zones; up to eight focal zones on selected transducers
- Continuous dynamic receive focusing on all transducers

S4-2 Broadband Sector Array

- Steerable CW Doppler, PW Doppler, High-PRF Doppler, color Doppler, Color Power Angio, Tissue Doppler Imaging, XRES and harmonic imaging
- Adult cardiac, deep abdominal, obstetrical and gynecological applications
- Supports reusable plastic bracket with disposable biopsy guides
- Transcranial Doppler

S3-1 Broadband Sector Array

- Steerable CW Doppler, PW Doppler, High-PRF Doppler, color Doppler, Color Power Angio, Tissue Doppler Imaging, freehand 3D, XRES and harmonic imaging
- Field of view: 90 degrees
- Contrast imaging
- General abdominal and adult cardiology applications; transcranial Doppler

S8-3 Broadband Sector Array

- Field of view: 90 degrees
- Steerable PW Doppler, CW Doppler, High-PRF Doppler, color Doppler, Color Power Angio, Tissue Doppler Imaging, freehand 3D and XRES imaging
- Adult and pediatric cardiology applications; fetal echo

System Specifications

S12-4 Broadband Sector Array
- Field of view: 90 degrees
- Steerable PW Doppler, CW Doppler, High-PRF Doppler, color Doppler, Color Power Angio, XRES and Tissue Doppler Imaging
- Pediatric cardiology applications

S7-2omni Broadband Sector Array
- 180 degrees electronic rotation, field of view: 90 degrees
- Steerable PW Doppler, CW Doppler, High-PRF Doppler, color Doppler, Color Power Angio, Tissue Doppler Imaging, XRES and harmonic imaging
- Adult transesophageal applications

OmniPlane Adapter
- Enables system to support use of TEE OmniPlane III transducer (Model #21378A)

S7-3t Broadband Sector Array
- 180 degrees mechanical rotation, field of view: 90 degrees
- Steerable PW Doppler, CW Doppler, High-PRF Doppler, color Doppler, Color Power Angio, Tissue Doppler Imaging, XRES and harmonic imaging
- Pediatric and small adult transesophageal applications

C5-2 Broadband Curved Array
- Steerable pulsed Doppler, color Doppler, Color Power Angio, SonoCT, harmonic, Panoramic and XRES imaging
- Field of view: 75 degrees
- Contrast imaging
- General purpose abdominal, obstetrical and gynecological applications
- Supports reusable plastic bracket with disposable biopsy guide (14–25 gauge)

C6-3 Broadband Curved Array
- Steerable pulsed Doppler, color Doppler, Color Power Angio, SonoCT, harmonic, Panoramic and XRES imaging
- Field of view: 72 degrees
- Contrast imaging
- General purpose abdominal, obstetrical and gynecological applications
- Supports reusable, multi-angle, plastic bracket with disposable biopsy guide (14–25 gauge)

C8-5 Broadband Curved Array
- Field of view: 90 degrees
- Steerable pulsed Doppler, color Doppler, Color Power Angio, harmonic, freehand 3D, Panoramic and XRES imaging
- Neonatal, cephalic imaging and pediatric abdominal
- Supports reusable plastic bracket with disposable biopsy guide (14–25 gauge)
- Biopsy kit available

C9-4 Broadband Curved Array
- Field of view: 64 degrees
- Steerable pulsed Doppler, color Doppler, Color Power Angio, freehand 3D, Panoramic, SonoCT and XRES imaging
- General purpose small adult and pediatric abdominal, obstetrical and gynecological applications
- Supports reusable plastic bracket with disposable biopsy guide (dual angle) (14–25 gauge)

BP10-5ec Broadband Biplane Curved Array
- Biplane intersecting sagittal and transverse sectors, 8 mm radii of curvature, fields of view: 126 degrees
- Steerable pulsed Doppler, color Doppler, Color Power Angio, harmonic, freehand 3D, Panoramic, SonoCT and XRES imaging
- Endorectal and endovaginal applications for urology
- Supports disposable transrectal biopsy guide (16–18 gauge)

C9-5ec Broadband Curved Array
- End-fire sector, 8 mm radius of curvature, field of view: 150 degrees
- Steerable pulsed Doppler, color Doppler, Color Power Angio, Freehand 3D, Panoramic, SonoCT and XRES imaging
- Endocavitary applications including endovaginal and endorectal
- Supports reusable plastic bracket with disposable biopsy guide (16–22 gauge)

C8-4v Broadband Curved Array
- End-fire sector, 11 mm radius of curvature, field of view: 135 degrees
- Steerable pulsed Doppler, color Doppler, Color Power Angio, Panoramic, SonoCT and XRES imaging
- Endovaginal applications
- Supports reusable stainless steel biopsy guide (15–22 gauge)

3D9-3v Broadband Curved Array

- Field of view: 130 degrees
- Supports high resolution 2D imaging
- Supports high resolution, quantitative, single sweep 3D volume acquisition
- Supports 4D imaging
- Steerable pulsed Doppler, color Doppler, Color Power Angio, SonoCT, XRES, Panoramic and harmonic imaging
- Endovaginal applications
- Supports disposable biopsy guide (16–22 gauge)

V6-2 Broadband Curved Array

- Supports high resolution 2D imaging
- Supports high resolution, quantitative, single sweep 3D volume acquisition
- Supports 4D imaging up to 30 volumes per second
- Supports 3D Fetal Echo STIC imaging
- Supports 3D Color Doppler
- Field of view: 70 degrees
- Steerable pulsed Doppler, High-PRF Doppler, color Doppler, Color Power Angio, Freehand 3D, Panoramic, SonoCT, XRES, and harmonic imaging
- General purpose abdominal, obstetrical and gynecological applications
- Supports reusable plastic bracket with disposable biopsy guide (dual angle) (14–23 gauge)

V8-4 Broadband Curved Array

- Supports high resolution 2D imaging
- Supports high resolution, quantitative, single sweep 3D volume acquisition
- Supports 4D imaging up to 30 volumes per second
- Supports 3D Fetal Echo STIC imaging
- Supports 3D Color Doppler
- Field of view: 85 degrees
- Steerable pulsed Doppler, High-PRF Doppler, color Doppler, Color Power Angio, SonoCT, XRES, Panoramic and harmonic imaging
- General purpose small adult and pediatric abdominal, obstetrical and gynecological applications
- Supports reusable plastic bracket with disposable biopsy guide (dual angle) (14–23 gauge)

L9-3 Broadband Linear Array

- Fine pitch, 160 element, high-resolution linear array
- Harmonics capable
- 15 degrees of trapezoid imaging
- 38 mm effective aperture length
- Steerable pulsed Doppler, color Doppler, Color Power Angio, SonoCT, XRES, Panoramic and harmonic imaging
- General imaging, vascular and superficial imaging applications
- Supports reusable plastic bracket with disposable biopsy guide (dual angle) (14–25 gauge)

L8-4 Broadband Linear Array

- Fine pitch, 160 element, high-resolution linear array
- 15 degrees of trapezoid imaging
- 38 mm effective aperture length
- Steerable pulsed Doppler, color Doppler, Color Power Angio, SonoCT, XRES, Panoramic and harmonic imaging
- General imaging, vascular and superficial imaging applications
- Supports reusable plastic bracket with disposable biopsy guide (dual angle) (14–25 gauge)

L12-3 Broadband Linear Array

- 10 degrees of trapezoidal imaging
- 35 mm effective aperture length
- Steerable pulsed Doppler, color Doppler, Color Power Angio, SonoCT, XRES, Panoramic and harmonic imaging
- High resolution superficial applications including small parts, breast, superficial vascular and musculoskeletal imaging
- Supports reusable stainless steel biopsy guide

L12-5 50 mm Broadband Linear Array

- Fine pitch, 256 element, high-resolution linear array
- 50 mm effective aperture length
- 10 degrees of trapezoidal imaging
- Steerable pulsed Doppler, color Doppler, Color Power Angio, Panoramic, SonoCT and XRES imaging
- High resolution superficial applications including small parts, breast, vascular and musculoskeletal imaging
- Supports reusable plastic bracket with disposable biopsy guide (up to 14 gauge)

System Specifications

L15-7io Broadband Compact Linear Array
- 23 mm effective aperture length
- 8 degrees of trapezoidal imaging
- Steerable pulsed Doppler, color Doppler, Color Power Angio, Panoramic and XRES imaging
- High resolution intraoperative vascular applications

D2cwc (Continuous Wave and Pulsed Wave) Transducer
- Dedicated 2 MHz continuous wave Doppler
- Adult cardiology applications

D5cwc (Continuous Wave) Transducer
- Dedicated 5 MHz continuous wave Doppler
- Deep venous and arterial applications

D2tcd (Pulsed Wave) Transducer
- Transcranial Doppler applications
- Peripheral vascular applications

Advanced Imaging Controls

2D Grayscale Imaging
- Frame rate selection
- 8-level digital reconstructed zoom with pan capability
- High Definition (HD) zoom concentrates all image processing power into a user-defined area of interest; possible to combine HD Zoom with Pan Zoom
- Image orientation marker
- Cineloop image review
- Persistence, adjustable in real time and cineloop review
- Selectable 2D compression settings
- Sector size and steering control for sector and curved array image formats
- Dual imaging with independent cineloop buffers
- Selectable line density
- Up to eight transmit focal zones plus separation control
- Chroma imaging with multiple color maps
- 256 (8 bits) discrete gray levels
- 2D acquisition frame rates up to 785 frames per second (dependent on probe, field of view, depth and angle)
- 9,216 digitally processed channels

Fusion Signal Processing
- Multi-channel frequency compounding for improved tissue contrast resolution and textural perception
- Up to five settings for patient-specific adjustments in 2D mode
- One button to emphasize between resolution, texture or penetration

iSCAN Intelligent Optimization
- One-touch image optimization
  - In 2D mode, one button automatic adjustment of:
    - TGC and Receiver Gain to achieve optimal uniformity and brightness of tissues
    - Compression curve based on the range of detectable tissue signals
  - In Doppler mode, one button automatic adjustment of:
    - Doppler scale based on detected velocity
    - Doppler baseline based on detected flow direction
- Available on all curved, linear and phased (non cardiac presets) array transducers
- Operates in conjunction with SonoCT and XRES imaging

SonoCT Real-time Compound Imaging
- High precision beam-steered image compounding for acquisition of more tissue image information and reduction of angle generated artifacts
- Up to nine beam-steered lines of sight
- Available on C5-2, C6-3, C9-4, BP10-5ec, C9-5ec, C8-4v, L8-4, L9-3, L12-3 and L12-5 50 mm transducers
- 3D9-3v, V6-2 and V8-4 transducers in 2D modes only
- Two modes of operation: Survey and Target
- Operates in conjunction with Tissue Harmonic Imaging and duplex Doppler
- Operates in conjunction with XRES imaging
- Available in contrast modes

XRES Adaptive Image Processing
- Philips proprietary real-time processing technology that analyzes image content down to pixel level
- Applies adaptive enhancement to virtually eliminate noise and sharpen margins/borders to improve conspicuity of tissue patterns
- Processing available in live or frozen 2D image, as well as 3D/4D MPRs and volume views
- Available on all imaging transducers
- Available in all imaging modes including color flow and Doppler
- Operates in conjunction with SonoCT real-time compound imaging on C5-2, C6-3, C9-4, C9-5ec, L8-4, L9-3, L12-3 and L12-5 50 mm transducers
- Available on 3D9-3v, V6-2 and V8-4 transducers in 2D mode only

Imaging Modes

M-mode

- Available with all imaging transducers
- Selectable sweeping rates
- Time markers: 0.1 and 0.2 seconds
- Acquisition zoom capability
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis of M-mode data
- Full-screen M-mode display facilitates diagnoses by enabling easier, more accurate caliper placement
- Color M-mode on all sector transducers and C5-2, C8-4v and C9-4 transducers

Anatomical M-mode

- Uses 2D image as a basis for M-mode analysis at a defined line, independent of transducer orientation
- Makes it easier to keep the M-mode line perpendicular to the anatomy, even in abnormally shaped or positioned hearts
- Provides data on direction, position and timing of any single echo received from any point of the tissue for M-mode analysis in any direction, for examining cardiac chamber diameters, LV regional wall motion and location of accessory pathways
- Anatomical M-mode trace can be generated or modified post Freeze
- Anatomical M-mode on all sector transducers, including S3-1, S4-2, S7-2, S7-3t, S8-3, and S12-4

Spectral Doppler

- Display annotation including Doppler mode, scale (cm/sec or kHz), Nyquist limit, pulse repetition frequency, wall filter setting, gain, acoustic output status, sample volume size, normal/inverted, angle correction and grayscale curve
- Adaptive Doppler boosts weak signals to improve spectrum visibility and enhances pulsed-wave audio signals for precise flow assessment
- Intelligent Doppler Imaging—automatically maintains optimal angle-to-flow to assist in delivering accurate and consistent Doppler velocity measurements (available with vascular and general imaging application packages on linear transducers)
- Adjustable frequency/velocity display ranges
- 8-position zero baseline shift
- Normal/invert display around horizontal zero line
- Selectable sweep speeds
- Selectable grayscale curve for optimal display
- Selectable display format (1/3–2/3, 1/2–1/2, 2/3–1/3)
- Full-screen Doppler display improves diagnoses by enabling easier, more accurate caliper placement
- Doppler review for retrospective analysis of Doppler data

Pulsed Wave (PW) Doppler

- Available on all imaging transducers
- Adjustable sample volume size: 0.05–2.63 cm
- Duplex mode—displays tissue movement and blood flow in 2D and PW Doppler simultaneously
- Triplex mode—displays tissue movement and blood flow in 2D, color/CPA and PW Doppler simultaneously
- High-PRF capability in all modes including Duplex and Triplex
- iSCAN optimization automatically adjusts scale and baseline

Steerable Continuous Wave (CW) Doppler

- Cardiac sector array transducers only
- Steerable through 90 degree sector
- Maximum velocity range: 19 meters per second (transducer dependent)

Color Doppler

- Adaptive Color automatically optimizes color or Color Power Angio frequencies, ensuring excellent sensitivity and color penetration
- Color Compare simultaneously displays real-time Color Power Angio, color Doppler, grayscale and TDI images side-by-side
- Automatic Color Invert automatically inverts color maps to maintain selected color coding when the linear steering angle passes through vertical
- Available on all imaging transducers
- Cineloop review
- Chroma 2D colorization with multiple color maps
- 256 color bins
- Continuously variable color steering
- Trackball-controlled color region of interest: size and position
- Maps, filters, color sensitivity, line density, smoothing, echo write priority, color persistence, gain and baseline optimized automatically by preset or is user selectable

System Specifications

- Velocity and variance displays
- Color/2D line density control
- Selection of color bar display units
- Color acquisition frame rates up to 320 frames per second (dependent on probe, field of view, depth and angle)

Contrast Imaging

- System optimized for detecting harmonic agent signatures
- Variable low Mechanical Index (MI) and flash modes
- Pulse Inversion Harmonic imaging on the S3-1 transducer for cardiac and abdominal applications and the C5-2 transducer for general abdominal applications
- Start/Stop timer
- On-screen indicators are activated when contrast is selected

Tissue Harmonic Imaging (THI)

- Second harmonic processing reduces artifacts and improves image clarity
- Incorporates patented pulse inversion phase cancellation technology for maximum detail resolution during harmonic imaging
- Extends high performance imaging capabilities to all patient body types
- Supports SonoCT and XRES modes
- Available on the S7-2omni, S7-3t, S4-2, S3-1, C5-2, BP10-5ec, L12-3, L8-4, 3D9-3v, V6-2 and V8-4 transducers

Color Power Angio Imaging (CPA)

- Highly sensitive mode for small vessel visualization
- Available on all imaging transducers
- Fully user-configurable
- Cineloop review
- User-definable presets
- Multiple maps including directional CPA
- Individual controls for gain, filters, sensitivity, echo write priority and color invert
- Adjustable CPA region of interest: size and position
- User-selectable persistence
- TGC control
- Write priority
- Color compare

Tissue Doppler Imaging (TDI)

- Color TDI uses color to display direction and timing of myocardial function
- Pulsed wave Tissue Doppler Imaging (TDI) for velocity mapping of cardiac tissue and vessel wall motion
- Available on all sector transducers
- Simultaneous or duplex mode of operation in conjunction with 2D, color Doppler and color TDI
- LGC and TGC controls

Freehand 3D and MPR Imaging

- Qualitative grayscale volume acquisition supported on all imaging transducers
- Volume display with surface rendering (transparency, brightness and lighting controls)
- Multiplanar view display
- Specialized algorithms and maps maximize three dimensional display
- Trim tools on both volume and multiplanar reconstructed (MPR) views
- Supported by XRES to reduce noise artifacts
- Color compare

Automated 3D, 4D and MPR Imaging

- Quantitative 3D volume acquisition supported on V8-4, V6-2 and 3D9-3v transducers
- Ability to acquire and display up to 30 volumes per second in 4D
- Color 3D imaging
- High resolution scan and review mode
- Multiple display formats including full screen, 2-up and 4-up for rendered volume and multiplanar images include full screen, 4-up and expanded dual
- Volume display with surface rendering (transparency, brightness and lighting controls)
- Specialized algorithms and maps maximize three dimensional display
- Individual controls for manipulating the on-screen 3D rendering and display options
- Region of Interest (ROI) trim tools on both volume and multiplanar reconstructed (MPR) views
- V8-4, V6-2 and 3D9-3v transducers support XRES and SonoCT to reduce noise artifacts
- Able to perform distance, ellipse, trace and volume measurements

Fetal STIC (Spatio-Temporal Image Correlation) Imaging

- Presents the heart beating in a multiplanar display, preserving spatial and temporal relationships
- Utilizes MPR views and cine capabilities for evaluating fetal heart anatomy
- System supports capabilities to perform the spin technique to assess pathology
- Fetal Echo STIC supports image capture in gray scale only or combined with Color Doppler
- Useful for easy detection of fetal heart anomalies during routine obstetrical exams

Expanded Field of View

- Panoramic Imaging
  - Extended field of view composite imaging
  - Full zoom, pan, cineloop review and image rotation capabilities
  - Available on linear, curved and sector (non-cardiac presets) array transducers
- Trapezoidal imaging
  - Expands field of view on linear array transducers up to 15 degrees on each side in vascular and general imaging applications

Stress Echo

- Fully integrated stress echo module
- 3 fixed protocols
- Up to 8-stage capture-and-study protocols
- User-defined protocols
- Wall motion scoring
- Stop/resume

ICE Imaging (Intracardiac Echocardiography)

- Catheter-based 2D echo imaging
- Includes Patient Isolation Module that allows HD11 XE to interface with EP MedSystems ViewFlex imaging catheters (available only from EP MedSystems)

System Features

System Cart

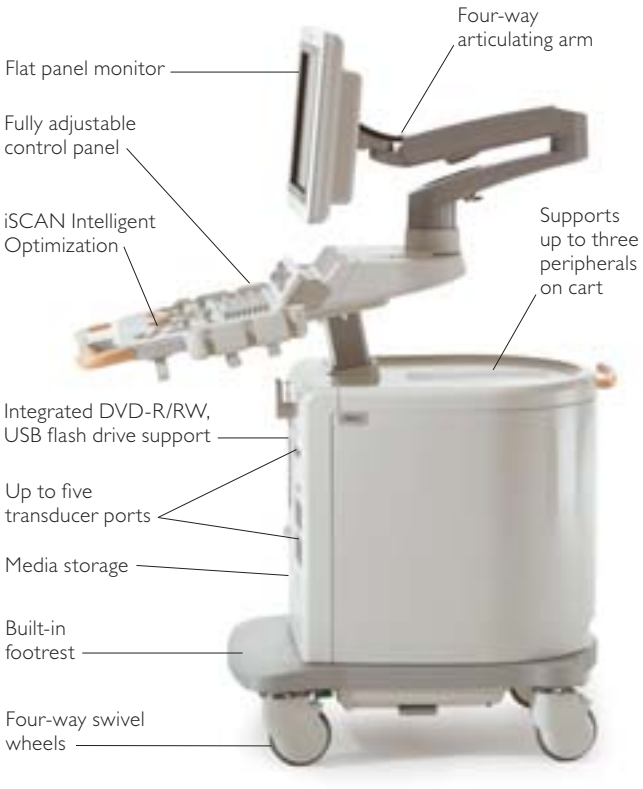
- Advanced ergonomic design
- Easy maneuverability and mobility
  - Wheel-lock facilitates bedside exams
  - Front and rear handles for portability
  - Four-wheel swivel ability with two-wheel swivel lock and brakes
- Control panel
  - Articulation facilitates optimal position up and down 7 in/18 cm
  - Rotates 340 degrees
  - Lighted alphanumeric QWERTY keyboard
- Flat panel LCD display monitor
  - 20 in/51 cm high resolution flat panel TFT display
  - 1280 x 1040 resolution at 60 Hz, non-interlaced RGB
  - 0.258 mm pixel pitch
  - Digital interface
  - Extended viewing angle > 170 (horizontal and vertical)
  - Virtually flicker-free technology reduces eye strain
  - Backlight stabilization circuit to help maintain contrast and extended LCD life
  - Ambient lighting control for optimal image viewing in both light and dark environments
  - Mounted on fully articulating extension arm
  - Four-way articulation with 10 inches of height adjustment
  - Side-to-side lateral adjustment
  - Nearly infinite positioning adjustments: height, swivel and tilt
- Transducer and gel bottle holders (removable for easy cleaning)
- Integrated footrest
- On-board storage in convenient pull-out bin located on front of cart
- Universal peripheral bay and back deck provide easy access for up to three on-board hardcopy/documentation devices
- Configurable with up to five active transducer ports
- Lighted area for easy visualization of transducer ports, storage bin and disk drives
- Power supply meets IEC 60601-1.2: 2001 and Class B EMI standards
- Three internal high-capacity impeller fans with automatic speed adjustment to optimize cooling efficiency with minimal audible noise

Control Panel and User Interface

- Easy-to-learn graphical user interface
- Primary controls readily accessible and logically grouped
- Commonly used secondary controls located on soft keys for quick access; soft key functions change dynamically based on the currently active mode, preset or system function
- Other secondary controls accessible through on-screen menus
- Alphanumeric QWERTY keyboard with world keys for conversion to local language (English, French, German, Italian, Spanish and Russian)

System Specifications

- User selectable keyboard stroke language (Roman, Kanji, Hiragana, Katakana and Simplified Chinese)
- Trackball with Select and Enter keys for easy system navigation
- Integrated stereo speakers
- Imaging mode keys: 2D, 3D/4D, Color Power Angio imaging, M-mode, color Doppler, Continuous Wave (CW) Doppler, Pulsed Wave (PW) Doppler and TDI
- Image controls: Depth, Dual Left, Dual Right, Freeze, THI, Zoom Focus
- Image enhancement controls: Dynamic Range, Focus, Gain, Persistence, Post-processing Map, Smooth, Update
- Patient specific optimization keys: Fusion, Probe (transducer select), THI
- iSCAN control for 2D/Doppler automatic optimization
- Quantitative controls: Calc, Caliper, Trace, Clear, Trackball
- Doppler/Color controls: Angle/Steer, Spectral, Scale, Baseline, Gain 2D/M-mode, Gain Color/Doppler, Power, Volume
- Image Acquisition keys: Review, Report, VCR, Acquire and two user-defined record keys supporting external print/video options
- Annotation controls: Label, Text, Clear, Arrow, Marker (Bodymarker)
- Function keys: Microphone, Patient, Preset, Setup
- Two option keys activated with additionally purchased features stress echo and contrast
- Online Help key
- Lateral Gain Compensation (LGC) slide pot controls
- Time Gain Compensation (TGC) slide pot controls



Physical Dimensions

Depth: 43.5 in/110.5 cm (no peripherals)
Width: 21 in/53.3 cm
Ground clearance: 4 in/10.2 cm
Height (adjustable): 59.5–68.5 in/151.1–173.9 cm
Control panel height (adjustable): 32.3–37.7 in/82–96 cm
Wheels: 5 in/12.7 cm diameter, 3.8 in/9.5 cm wide
Weight: 220 lbs/100 kg (no peripherals)

3D/4D STIC Controls

- 3D/4D hard control
- ROI
- X,Y,Z controls for MPRs
- Axis icons
- Sculpt/Erase controls: Sculpt, Erase, Starts/Ends Editing, Undo, Redo, Reset
- 3D preview controls for Color, CPA and Grayscale images: Size, Position, Fan geometry, Angle selection and resolution settings along with standard color controls where color is used
- 4D Preview controls: Size, Position, Angle, Resolution, Compression, Map color, Smooth and Persist
- Color Fetal Echo STIC preview controls: Size, Position, Angle, Acquisition Time, Compress, Map Color, Smooth and Persist
- Biopsy software for 2D biopsies with 4D probes
- Rendering controls for MPR, Volume, Render Edit ROI, 4D Acquisition (Volume and ROI): Pan, X-Hair, Slice, Size, Acquire, Rotate, Format, Sculpt/ Erase, Swivel, View, Resize, Reset Threshold, Transparency, Brightness, Opacity, Reset, Smooth, Next, Select
- Image controls: Render Mode in Grayscale, MPR Chroma, Volume Chroma, Vision (Surface Vision), Invert, Invert with Color, Volume Map, Render Mode, Adjust, Priority, Next, Select
- Edit ROI cine controls include Acquire 3D data, Format, Replay, Render controls, Image controls, Accept ROI

- Volume cine MPR and Volume controls: Pan, X-Hair, Slice, Scroll, Orbit, Rotate, Scroll, Acquire 3D data, Format, Replay, Render Controls, Accept ROI, Sculpt/ Erase, Swivel, View, Edit Start, Edit End and Reset
- Swivel Stopped and Playing controls: Orbit Rotate, Acquire 3D Data, Left-Right Step, Min Angle, Max Angle, Play, Resume, Reset, Speed, Stop, Step Size, Play Sequence, Next, Freeze, Select, Acquire

Display Annotation

- On-screen annotation of all pertinent imaging parameters for complete documentation, including transducer type and frequency range, active clinical options and optimized presets, display depth, TGC curve, grayscale, color map, frame rate, dynamic range, compression and contrast enhancement, color gain, color image mode, and hospital and patient demographic data
- User selectable display of patient birth date or user ID
- Annotation data and patient name can be turned off (hidden) for generating images used in publication and presentation
- Sector Steering Icon for endocavitary transducers
- Scan plane orientation marker
- User selectable Depth Scale display
- Fusion setting, iSCAN, SonoCT and contrast icons
- Real-time display of Mechanical Index (MI)
- Real-time display of Thermal Index (TIb, TIc, TIs)
- Quick text allows easy annotation at any time during an exam
- Label—places, moves, erases, modifies or appends predefined text labels, typed text or arrows
- Body markers—display body-part icons appropriate for the active preset and indicates relative transducer position
  - Icons selectable via trackball scroll
- Doppler baseline Invert in Live imaging
- TGC curve (user selectable On/Off display)
- TGC values (On/Off display)
- Calculations Results and Analysis labels
- Cineloop frame number display
- User selectable placement of measurement/calculations data box

Reporting

- On screen display of LMP and GA or GA and EDC for Obstetric Exams
- Auto population of patient data if study with same MRN exists on hard drive
- System provides application specific reports that provide application specific information
- Ability to embed images into reports
- Measurement data can be entered directly into reports from the ultrasound system

Image Presentation

- Up/down
- Left/right
- Multiple duplex image formats (1/3–2/3, 1/2–1/2, 2/3–1/3)
- Depth to 30 cm (exam/transducer specific)

Cineloop Review

- Acquisition, storage in memory and display in real-time and duplex modes of up to 1,000 frames (four minutes in Quick Review) of 2D and color images for retrospective review and image selection
- Single frames of Doppler data and M-mode images can be archived to print or electronic media
- Supports two-buffer Dual Imaging mode of up to 500 frames per buffer
- Trackball control of frame-by-frame image selection
- Variable playback speed
- Trim capability of 2D data
- Functions in 2D and Tissue Harmonic imaging, M-mode, PW Doppler, CW Doppler, color Doppler, Color Power Angio imaging, Tissue Doppler Imaging and Contrast imaging

Physio

- One 3-lead ECG input
- One external ECG input
- Two physio input channels (1V, p-p)
- Selectable ECG triggered skipping between 1 and 20

Connectivity

- 120 GB hard drive space (minimum)
- Standard with CD-R/RW, DVD-R/RW, USB flash drive support
- Direct digital storage of single frame color and B/W images to internal hard disk, DVD, CD, and USB flash drive
- Direct digital storage of B/W and color loops to internal hard disk, DVD, CD, and USB flash drive
- Stores a minimum of 900,000 B/W still frame images to internal hard drive

System Specifications

- 4.7 GB DVD stores a minimum of 3,000 B/W still frame images (RGB uncompressed format), or 9,000 B/W still frame images (palette color uncompressed format) or 115,000 B/W still frame images (YBR JPG compressed format at typical 16:1 compression ratio)
- Ability to export AVI clips and BMP images to CD, DVD or USB flash drive for PC viewing
- Fully integrated interface
- Extensive image management capability, including thumbnails image review, full screen image review, cineloop editing and patient reporting
- Study manager allows user to digitally acquire and review complete patient studies
- Exam directory
- Delete and replace recalled image capability
- Multiple study archive formats (palette color, RGB, YBR)
- DICOM 3.0 Print and Store services class user
- 10/100 BaseT Ethernet output
- Site configurable IP address, port ad AE title
- Perform Procedure Step (PPS)
- Modality Worklist with automatic entry of patient demographics that works in conjunction with radiology and cardiology information systems
- Structured Reporting (SR) includes Cardiology and Ob/Gyn
- Study reports available as DICOM images and HTML formats
- System can use lossy JPG image format with user configurable compression ratio
- DICOM Networking option
  - Print and Store service class user
  - Performed Procedure Step (PPS)
  - DICOM Worklist with RIS/CIS support and automatic patient demographic entry
- Study reports available as DICOM images
- System can use lossy JPG image compression, ratio = 10:1–20:1 (typically 16:1)
- Philips RSN (Remote Services Network) Connectivity
  - Supports rapid, advanced support delivered from anywhere around the world
  - Remote diagnostics for faster, more accurate equipment evaluation
  - Remote system status verification
  - Routine preventative maintenance
  - Uses secure, encrypted communications link

Peripheral Devices/Exam Documentation

- System supports up to three on-board peripheral devices (excluding report printers)
  - Mitsubishi HS-MD3000 Super VHS VCR (USB controlled via system user interface)
  - Sony UP 21 MD digital color printer (USB)
  - Sony UP895 small format digital B/W printer
  - UPD 55MD large format color printer
  - Support for various Hewlett-Packard brand printers
  - Inkjet, LaserJet and Color LaserJet (USB, externally mounted)
  - Export of measurement and analysis data to off-line reporting software packages (USB) and PS-232 port to support obstetrical data transfer
  - Peripheral options come with shelf and cover
- Input/Output ports
  - Standard USB interface for support of qualified plain paper printers
  - B&W and color composite video: output to external monitor, VCR or printer
  - External print trigger
  - LAN connector—used with DICOM networking
  - Output DVI, 1280x1024 @ 60Hz
  - S-video output for VCR, external monitor or printer
  - Footswitch port for connecting the optional footswitch
  - Serial Port for Remote service connection (Uplink ready), and report Data Export
- Selective Print
  - Sends the type of data that makes the most sense for a particular application, for example compressed data to a PACS system, native data for QLAB
  - Allows faster movement of data
  - Allows selection of individual images to print in a batch

Security

- Password protected access to patient data
- Hardened operating system and application software

Electrical Power/Video Parameters

- 100V–240V, 50Hz/60Hz
- NTSC or PAL video formats
- Integrated A/C line conditioning
- Power consumption: 750VA–1000VA depending on system configuration
- 64 (6 bits) in M-mode
- Power cords available for electrical standards worldwide
- Uninterrupted power supply (UPS)

Safety Requirements

- Electromechanical standards met
  - C22.2 No. 601.1, Canadian Standards Association, Standard for Medical Electrical Equipment
  - JIS 60601-1, Japanese Standard for Medical Electrical Equipment
  - EN 60601-1, European Norm, Safety of Medical Electrical Equipment
  - EN 60601-1-2, European Norm, Collateral Standard: Electromagnetic compatibility
  - EN 60601-2-37, European Norm, Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment
  - UL 60601-1 Underwriters Laboratories Standard for Medical Electrical Equipment
  - AIUM/NEMA UD-2: 2004, Acoustic Output Measurement Standard for Diagnostic Ultrasound Equipment
  - AIUM/NEMA UD-3: 2004, Standard for Real-Time Display of Thermal and Mechanical Indices on Diagnostic Ultrasound Equipment
- Agency approvals
  - Canadian Standards Association (CSA)
  - CE Mark in accordance with the European Medical Device Directive 93/42/EEC
  - Japanese Ministry of Health, Labor and Welfare

Measurements and Analysis

Measurement Tools and General Description

- 2D distance
- 2D circumference/area by ellipse, continuous trace, trace by points
- 3D: ellipse and distance on 2 MPR views
- M-mode distance (depth, time, slope)
- Manual Doppler distance
- Manual Doppler trace
- Time/slope measurements in Doppler and M-mode
- High Q automatic Doppler analysis
- 2D volume
- Heart rate
- Trackball-controlled electronic measurement calipers: 8 sets
- User-defined protocols, measurements and equations
- On-the-fly measurement labels
- Fully-editable results data sheet
- Integrated patient exam report

Clinical Option Analysis Packages

Comprehensive measurements, calculations and application-specific reports with imbedded images, including expanded cardiac, vascular, Ob/Gyn and General Imaging capabilities for thorough exam documentation

- Cardiac analysis
  - Volume by area/length method
  - Ejection fraction (via Teichholz or cubed method)
  - Simpson's biplane and single plane
  - LV mass
  - M-mode analysis
  - Doppler
  - Peak and mean gradients
  - Pressure half time
  - E/A ratio
  - Continuity equation
  - Diastolic function
  - Cardiac output
  - Qp:Qs ratio
  - Proximal Isovelocity Surface Area (PISA)
  - TR max PG
  - TR max
  - PA V2 trace
  - Ao dec time
  - MV dec time
  - MV dec
  - PA dec time
  - PA dec
  - PA acel time
- Vascular analysis
  - Right and left carotid artery protocols measurements/analysis package
  - ICA/CCA ratio
  - Right and left vertebral measurements
  - Transcranial vasculature analysis package
  - Right and left lower extremity analysis package
  - Optional tools: percent diameter and area reduction
  - User comments
  - IMT trace

System Specifications

- Ob/Gyn and fertility analysis
  - Fetal biometry
  - Biophysical profile
  - Amniotic fluid index
  - Early gestation
  - Fetal long bones
  - Fetal cranium
  - Nuchal translucency
  - Other OB measurements:
    - 2D echo
    - Fetal heart M-mode
    - Fetal Doppler
    - Echo Doppler
    - Fetal echo
  - OB calculations and tables are user-definable
  - OB trending data for up to ten studies per patient, 15 studies for a patient plus the current study, including trending of MCA and Umbilical Artery
  - Display of up to 5 previous measurements on screen
  - Display of Standard Deviation (SD)
  - Automatic transfer of image to the report when a labeled measurement or calculation is done
  - Gynecology/Fertility
    - Uterus
    - Right and left ovary
    - Right and left follicles
- General Imaging analysis
  - General abdominal
  - Breast
  - Prostate gland
  - Pediatric general
  - Pediatric hips
  - Musculoskeletal

QLAB Advanced Quantification Plug-in Options

- Intima Media Thickness (IMT) Quantification Plug-in
  - Automated assessment of the IMT on user-selected frames
  - For carotid and other superficial arteries
- Region of Interest (ROI) Quantification Plug-in
  - Up to 10 user-defined regions
  - Thumbnail display of frames for easy trimming
  - Pixel intensity analysis, data types: echo, velocity or power (angio)
  - TDI velocity timing measurements
- Strain Quantification (SQ) Plug-in
  - For evaluation of regional myocardial function, assessment of synchronicity and guidance during bi-ventricular pacing procedures
  - Tissue Doppler Imaging (TDI) velocity quantification
  - Measures the myocardial velocity and derives the strain rate and strain along user defined M-lines
  - Capable of drawing up to three M-lines at a time
  - Point of Interest (POI) tool obtains values from any point on the M-mode display
  - User defined M-line motion to follow the myocardial motion
  - Able to present TDI results in two display formats:
    - Anatomical M-mode display
    - Graph display
  - User-selectable waveforms for optimal sub-region visualization
  - New curve processing modes
  - TDI velocity timing measurement
  - Automatic subdivision of M-line into a customizable number of sub-regions
  - Averages up to 20 cardiac beat cycles in both M-mode and graph displays

- Cardiac 2D Quantification (2DQ) Plug-in
  - Display of 2D ultrasound images
  - Overall, vertical and horizontal gain controls
  - Semi-automated border detection for cardiac chambers and vessel cavities
  - Color Kinesis (CK) tool for displaying mitral valve annular motion over time parametrically
  - Transparency control to visualize echo grayscale under a semi-transparent CK image
  - CK for arbitrary frame rates
  - CK for the mitral annulus (which represents the basal terminus of the LV endocardium)
  - Manual user-editable timing overrides for the onset and duration of the parametric display
  - Single-plane volume measurements based on the 5/6 Area-Length Method and Simpson's Singleplane Method of Disks (MOD)
- General Imaging 3D Quantification (GI 3DQ)
  - View, crop, rotate, access and use all vision controls
  - Advanced quantification tool for intelligent volumetric slicing (iSlice)
  - Quick exploration and documentation of volumetric data
  - Advanced slice control including spacing and thick slice displays
  - Full measurement capability
  - Perform everyday measurements on 3D ultrasound images:
    - Elevation resize for freehand volumes
    - Linear measurements
    - Angle determination
    - Ellipse measurements
    - Stacked contour measurements
    - Stacked ellipsoid measurements
    - Ellipsoidal volume measurements

High Q Automatic Doppler Analysis

- Automatic real-time and retrospective tracing of:
  - Instantaneous peak velocity (or frequency)
  - Instantaneous intensity weighted mean velocity (or frequency)
- Vascular
  - Automatic real-time display of:
    - Volume flow
    - Time-averaged peak velocity (or frequency)
    - Time-averaged mean velocity (or frequency)
    - Resistive index
    - Pulsatility index
    - Systolic/diastolic ratio
    - Acceleration/deceleration times
- Cardiology (pulsed wave only)
  - Automatic real-time display of:
    - Peak velocity
    - Peak gradient
  - Display of:
    - Cardiac output
    - VTI
    - Mean velocity
    - Mean gradient

Miscellaneous System Data

Footswitch

- Three pedals
- Allows Freeze, Start/Stop Doppler scroll and Acquire
- Includes two user-definable record functions

Localization Options

- Software: English, French, German, Italian, Spanish, Simplified Chinese, Japanese (Kanji, Hiragana, Katakana) and Russian
- Training and user documentation: English, French, German, Italian, Spanish, Japanese, Simplified Chinese, Polish, Portuguese and Russian
- Online help: English, French, German, Italian, Spanish, Portuguese, Russian and Polish

Environmental

- Temperature
  - System: 0–40° C at 20–80% relative humidity (non-condensing)
  - VCR and printers: 0–40° C at 80% relative humidity (non-condensing)
- Heat dissipation—<4000 BTUs/hour (fully loaded)

Transducers

Name		S3-1	S8-3	S12-4	S7-2omni	S7-3t	C6-3
Extended operating frequency range		3-1 MHz	8-3 MHz	12-4 MHz	7-2 MHz	7-3 MHz	6-3 MHz
Application	**Exam Type**						
Abdominal	General	●	●				●
	Renal						●
	Vascular						●
Obstetrics	Early OB						●
	General OB	●	●				●
	Fetal Echo						●
Gynecology	Pelvis						●
	Fertility						●
Cardiology	Pediatric		●	●		●	
	Adult General	●	●		●		
	Adult large	●			●		
Vascular	Carotid						
	Arterial						
	Venous						
	Abdominal						
Pediatric	Abdomen			●			
	Hip						
	Pediatric Cephalic		●	●			
	Neonatal Cephalic		●	●			
Small Parts	Superficial						
	Thyroid						
	Testicle						
	Breast						
Musculoskeletal	Superficial						
	General						
Urology	Prostate						
	Bladder						
	Renal						
Intraoperative	Cardiac						
	Vascular						
Transcranial		●					
Non-imaging	Transcranial Doppler						
	Vascular						
	Cardiac						

Explora

C8-5	C9-4	C8-4v	BP10-5ec	C9-5ec	L9-3	L8-4	L12-5 50 mm	L15-7io
8-5 MHz	9-4 MHz	8-4 MHz	10-5 MHz	9-5 MHz	9-3 MHz	8-4 MHz	12-5 MHz	15-7 MHz
	●							
	●							
	●	●		●				
	●	●		●			●	
	●	●		●				
	●	●		●				
		●		●				
●					●	●	●	
●					●	●	●	●
●					●	●	●	
●	●						●	
					●	●	●	
●								
							●	
					●	●	●	
							●	
					●	●	●	
							●	
			●	●				
			●					
								●
								●

Transducers

		Explora 3D			Cartridge		
							
Name		**V6-2**	**V8-4**	**3D9-3v**	**S4-2**	**L12-3**	**C5-2**
Extended operating frequency range		6-2 MHz	8-4 MHz	9-3 MHz	4-2 MHz	12-3 MHz	5-2 MHz
Application	**Exam Type**						
Abdominal	General				●	●	●
	Renal						●
	Vascular						●
Obstetrics	Early OB	●	●	●			●
	General OB	●	●	●	●		●
	Fetal Echo	●	●	●			●
Gynecology	Pelvis			●			●
	Fertility			●			●
Cardiology	Pediatric						
	Adult General				●		
	Adult large				●		
Vascular	Carotid					●	
	Arterial					●	
	Venous					●	
	Abdominal						●
Pediatric	Abdomen						●
	Hip						
	Pediatric Cephalic						
	Neonatal Cephalic						
Small Parts	Superficial						
	Thyroid						
	Testicle						
	Breast					●	
Musculoskeletal	Superficial						
	General					●	
Urology	Prostate						
	Bladder						
	Renal						●
Intraoperative	Cardiac						
	Vascular						
Transcranial					●		
Non-imaging	Transcranial Doppler						
	Vascular						
	Cardiac						

Non-imaging		
		
D2tcd	**D2cwc**	**D5cwc**
●		
		●
	●	●

Note: Purchase of an on-cart QLAB plug-in includes a matching standalone off-cart plug-in at no additional charge. Standalone plug-ins may be used on a PC; they are not compatible with Xcelera systems.

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