PHILIPS

Ultrasound

Affiniti 70

It **understands** your everyday

Philips Affiniti 70 diagnostic ultrasound system specifications

Contents

1 Introduction 4
1.1 Applications 4

2 System overview 5
2.1 System architecture 5
2.2 Imaging formats 6
2.3 Imaging modes 6
M-mode 6
2D imaging 6
Tissue Harmonic Imaging (THI) 7
Color Doppler 7
Color Power Angio imaging (CPA) 7
MicroFlow Imaging (MFI) 8
Spectral Doppler 8
Auto color and Auto Doppler 8
Steerable continuous wave (CW) Doppler 8
Tissue Doppler Imaging (TDI/TDI PW) 8
Seek Angle echo (X7-2t) 8
Live xPlane imaging 8
Live 3D echo 9
Live 3D/4D and MPR/iSlice imaging 9
3D/4D and MPR imaging (hybrid transducers) 9
Freehand 3D volume and MPR imaging 9
Spatio-Temporal Image Correlation (STIC) imaging 9
Panoramic imaging 10
Contrast imaging – cardiovascular 10
Contrast imaging – general imaging 10
Interventional imaging 10
Strain-based elastography 10
Shear wave elastography 10

3 System controls 11
3.1 Optimization controls 11
2D grayscale imaging 11
Next-generation SonoCT real-time compound imaging 11
XRES adaptive image processing 11
Live volume imaging (GI/WHC) 11
Tissue aberration correction (TAC) 12
iSCAN intelligent optimization 12
AutoSCAN intelligent optimization 12
iOPTIMIZE intelligent optimization 12
3.2 Control panel 12
3.3 Touchscreen 12

4 Workflow 13
4.1 Ergonomics 13
4.2 Display annotation 13
4.3 SmartExam protocols 14
4.4 Stress echo 14
4.5 Volume imaging solutions for connected radiology departments 15
4.6 Anatomical Intelligence for Breast (AI Breast) 15
4.7 QuickSAVE feature 15
4.8 Image presentation 15
4.9 Cineloop review 15
4.10 Exam management features 16
Rapid Procedure Setup 16
4.11 Connectivity 16
Standard connectivity features 16
NetLink connectivity option 17
Report 17
Government security option 17
SafeGuard security option 17
Security Plus option 17

5 Transducers 18
5.1 Transducer selection 18
Compact transducers 18
PureWave crystal technology 18
Curved array 18
C10-3v broadband curved array with PureWave crystal technology 18
C9-4v broadband curved array 18
C10-4ec broadband curved array 18
BP10-5ec broadband curved array 18
C9-2 broadband curved array with PureWave crystal technology 18
C8-5 broadband curved array 18
C5-1 broadband curved array with PureWave crystal technology 19
C6-2 broadband curved array 19
Volume array 19
V6-2 broadband curved array 19
3D9-3v broadband curved array 19
VL13-5 broadband linear array 19
Linear array 19
eL18-4 ultra-broadband linear array with PureWave crystal technology 19
eL18-4 EM ultra-broadband linear array with PureWave crystal technology 19
L18-5 broadband linear array 20
L15-7io broadband compact linear array 20
L12-5 50 broadband linear array 20
L12-3 broadband linear array 20
L12-4 broadband linear array 21
Sector array 21
S4-2 broadband sector array 21
S5-1 broadband sector array with PureWave crystal technology 21
S8-3 sector array 21
S12-4 sector array 21

S7-3t sector array TEE 21
S8-3t sector array TEE 21
X7-2t xMATRIX array TEE with PureWave technology 21
Non-imaging 21
D5cwc CW transducer (Pedoff) 21
D2cwc CW transducer (Pedoff) 21
D2tcd PW transducer (Pedoff) 21
5.2 Transducer application guide 22

6 PercuNav image fusion and interventional navigation 27
6.1 Overview 27
Ultrasound only 27
Image Fusion and Navigation 27
Interventional navigation and planning software 28
Interventional navigation tracking instrumentation 28
Anatomical measurements 28
Connectivity 28
PercuNav accessories 29

7 Measurements and analysis 30
7.1 Measurement tools and general description 30
7.2 Measurement tools and quantification 31
QLAB quantification software 31
Cardiac 3D Quantification (3DQ) 31
Cardiac 3D Quantification Advanced (3DQ Advanced) 31
General Imaging 3D Quantification (GI 3DQ) plug-in 32
Mitral Valve Navigator[A.I.] (MVN[A.I.]) 32
Intima Media Thickness (IMT) Quantification plug-in 32
MicroVascular Imaging (MVI) plug-in 32
Region of Interest (ROI) Quantification plug-in 33
Vascular Plaque Quantification (VPQ) plug-in 33
Strain Quantification (SQ) plug-in 33
Automated Cardiac 2D Quantification[A.I.] (a2DQ[A.I.]) and a2DQ[A.I.] LA 33
Automated Cardiac Motion 2D Quantification[A.I.] (aCMQ[A.I.]) 34
Elastography Analysis (EA) 34
Fetal Heart Navigator 34
Elastography Quantification (EQ) 34
7.3 High Q automatic Doppler analysis 35
7.4 Clinical option analysis packages 35

8 Physical specifications 37
System dimensions 37
System cart 37
Monitor 38
Control panel 38
Physio 38
Peripherals 38
Input/output ports 38
Power requirements and video parameters 38
Electrical safety standards 38

9 Maintenance and services 39
Security 39
Advanced service features 39

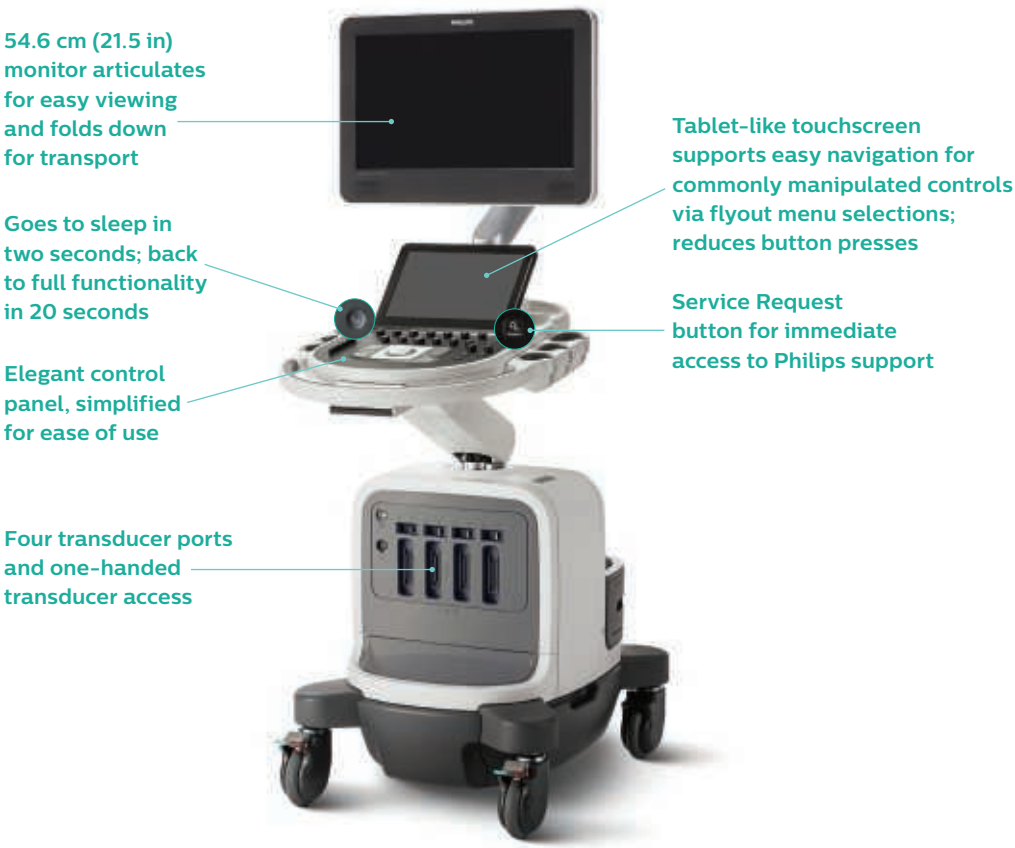
1. Introduction

You always go above and beyond to provide the best care to your patients. But you are expected to do so with less time, fewer resources, and higher patient volume. The care you want to provide deserves tools that can set you ahead and help you stay ahead.

We designed Philips Affiniti 70 to give you the confident results you need, in the time you have. Engineered for efficiency and reliability and powered by Philips superb performance, it gets you diagnostic images you need, quickly – even on the most technically difficult patients. Its intuitive design and walk-up usability help you provide elegant, efficient care – every day.

1.1 Applications

- Abdominal
- Obstetrical
- Fetal echo
- Cerebrovascular
- Vascular (peripheral, cerebrovascular, temporal TCD, and abdominal)
- Abdominal vascular
- Gynecological and fertility
- Small parts and superficial
- Musculoskeletal
- Pediatric general imaging
- Prostate
- Echocardiography (adult, pediatric, fetal)
- Stress echocardiography
- Transesophageal echocardiography (adult and pediatric)
- Surgical imaging
- Interventional imaging
- Contrast imaging
- Bowel imaging
- Strain elastography, shear wave elastography (ElastPQ)
- Perioperative
- Epicardial echocardiography



2. System overview

2.1 System architecture

- Offers up to 4,718,592 total digital channels
- Next-generation ultra-low noise, wide dynamic range, 280 dB, digital broadband acoustic beamforming with proprietary architecture
- Powerful distributed multi-core processing architecture capable of achieving 225 x 109 40-bit Multiply-Accumulates/second
- Includes 512 GB hard drive support for transducer frequencies up to 22 MHz
- Optimized for high definition 54.6 cm (21.5 in) LCD display
- Designed to support virtually any array configuration: sector, linear, curved, tightly curved, and TEE
- Contrast imaging uses both Pulse Inversion and power modulation technologies
- Supports depths from skin line (using zoom function) to 40 cm
- Supports both strain and shear wave elastography (ElastPQ)
- High precision beam-steered image compounding that acquires more tissue information and reduces angle-generated artifacts
- Up to nine lines of sight, obtained by steering the ultrasound beam, available on linear, curved and tightly curved arrays, and mechanical volume arrays
- WideSCAN capability to expand field of view during SonoCT imaging
- SonoCT capability available during contrast imaging modes
- Philips next-generation XRES adaptive image processing for noise and artifact reduction that enhances tissue and border definition
- Performs 350 million calculations per frame of image data up to 1900 frames per second
- Provides XRES capability when in contrast imaging modes
- Operates in 2D and 2D/CFI/Doppler/TDI mixed modes up to 1900 frames per second
- Philips adaptive broadband flow imaging
- Doppler bandwidth that automatically adjusts for outstanding flow sensitivity and resolution
- Advanced dynamic motion suppression algorithms that reduce flash artifacts
- Fully independent triplex multiple mode operation for ease of use during Doppler procedures
- Auto Doppler flow optimization for carotid/arterial applications using linear array transducers
  - Automatically adjusts color box position and angle
  - Automatically adjusts PW sample volume placement and angle
  - Includes Auto Flow Tracking for automatic angle correction with sample volume movements
- Advanced stress echo applications
  - Stress protocols with up to ten stages
  - Forty views per stage by five modes
- Multi-application SmartExam workflow protocols
  - Stress echo, echo, abdominal, small parts, Ob/Gyn, and vascular applications
  - Step-by-step on-screen guidance during exam
  - Full user customization
  - Record function for creation of custom protocols
  - Automatic mode switching including 3D
- Fast system boot up: from off, approximately 110 seconds
- Transport mode: from sleep mode to on, approximately 20 seconds
  - Transport mode lasts 40 minutes before recharge is needed

2.2 Imaging formats

- 2D linear: WideSCAN with SonoCT
- 2D curved: WideSCAN with SonoCT
- 2D sector
- 2D virtual apex sector imaging with wide field of view
- 2D trapezoid
- Dual 2D
- Panoramic imaging
- Live 3D/4D volume
- Live 3D/4D zoom
- 3D full volume
- 2D, MPR, and volume
- Dual volume for full volume, 3D zoom and iCrop
- MaxVue image format
  - Allows use of entire monitor viewing area for displaying image with a push of a button
  - Uses a high-definition resolution and an aspect ratio of 16:9

2.3 Imaging modes

- 2D grayscale imaging with advanced pulse coding, pulse shaping, and frequency compounding technologies
- M-mode
- M-mode color Doppler
- M-mode tissue Doppler
- M-mode trapezoid
- Anatomical M-mode
- TDI M-mode
- Tissue Doppler Imaging (TDI)
- Adaptive Doppler
- Adaptive Broadband Color Flow
- Color compare mode
- 3D imaging
- 3D imaging with Color Doppler/CPA/DCPA
- 4D imaging
- Tissue Harmonic Imaging (THI) with pulse inversion technology
- Multivariate Tissue Harmonic Imaging including pulse inversion technology
- Left ventricular opacification (LVO) with pulse inversion and power modulation technologies
- SonoCT beam-steered real-time compound imaging
- Harmonic SonoCT imaging
- Up to five levels of XRES adaptive image processing technology
  - Variable settings available to the user
- iSCAN intelligent scanning for one-button TGC and gain optimization (i.e., adaptive gain compensation – AGC)
- AutoSCAN with adaptive gain compensation (AGC) for real-time frame-by-frame TGC optimization
- Simultaneous 2D M-mode
- Color Doppler
- Color Power Angio imaging (CPA) and directional CPA
  - High resolution option available in relevant clinical applications
- Strain-based elastography
- Shear wave elastography point quantification imaging (ElastPQ)
- High-PRF pulsed wave (PW) Doppler
- Duplex and simultaneous 2D/PW Doppler
- Duplex continuous wave (CW) Doppler
- Duplex, color flow, CW Doppler
- Duplex 2D, CPA, color flow, PW Doppler
- Auto Doppler optimization: Auto PW Doppler, color Doppler, flow optimization for one-button angle correction and steering
- Independent triplex mode for simultaneous 2D, CPA, color flow, PW Doppler
- Dual imaging with:
  - Two work flow choices; single buffer or dual buffer
  - 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
- SonoCT panoramic imaging with XRES and harmonic modes
- Chroma imaging in 2D, 3D, QLAB MPR and iSlice, Panoramic, M-mode, and Doppler modes
- Dynamic colorization in freehand 3D on C9-4v, C10-3v and 3D/4D on V6-2, 3D9-3v, VL13-5
- Live MVI
- Spatio-Temporal Image Correlation (STIC)

M-mode

- Available on all imaging transducers
- Anatomic M-mode available on all imaging transducers
- TDI M-mode available in cardiac applications
- Selectable sweeping rates
- Time markers: 0.1 and 0.2 seconds
- Acquisition zoom capability
- Selectable display format prospective or retrospective (1/3-2/3, 1/2-1/2, 2/3-1/3, side-by-side, full screen)
- Chroma colorization with multiple color maps
- Cineloop review for retrospective analysis of M-mode data 256 (8 bits) discrete gray levels

2D imaging

- Available with all imaging transducers
- Adjustable sector width and position during live imaging
- Ability to invert image left and right, top and bottom
- Receive gain
- LGC (lateral gain compensation) on cardiac sector transducers
- Selection between one and eight focal zones
- Dynamic range or echo compression, transducer and Tissue Specific Presets (TSP)-dependent
- Gray map
- Chroma imaging providing colorized luminance maps

- Acquisition zoom (HD zoom): ability to position the zoom ROI anywhere within the image, and change the height and width of the zoom ROI
- Display zoom and magnify on live or frozen images up to 16 times
- Three levels of frame rate
- Support of frame rates of up to 1900 frames per second
- Tissue optimization
- Contrast resolution enhancement
- Tissue Harmonic Imaging
- SonoCT imaging
- Post-processing includes gain, dynamic range, up/down invert, right/left invert, zoom, gray map, and Chroma map
- Live Compare imaging; side-by-side comparison of 2D images where the current live image is compared to a stored image from the same study or retrieved multimodality image
- WideSCAN or trapezoid imaging
- Next-generation XRES technology
- Persistence (frame averaging)
- Grayscale standard display
- AutoSCAN with adaptive gain compensation (AGC) for real-time line-by-line TGC optimization

Tissue Harmonic Imaging (THI)

- Provides second harmonic processing to reduce artifacts and provides high quality images
- Multivariate pulsing including patented pulse inversion phase cancellation technology for increased detail resolution during harmonic imaging
- Available in all clinical applications
- Extends high performance imaging capabilities to all patient body types
- Support of SonoCT (Harmonic SonoCT) and XRES modes

Color Doppler

- Available on all imaging transducers
- Color gain
- Region of Interest (ROI)
- Freq Opt: fixed transmit/receive frequencies including adaptive flow
- Seventeen selectable baseline positions for CV, nine selectable baseline positions for GI, WHC
- Baseline invert
- B/W suppress
- Color blending
- Color compare dual display (B/W on left, color on right)
- Color map
- Color persistence
- Color trapezoid
- Flow optimization: GI, WHC
- Output power
- Magnify (range from 0.8X to 8X)
- Scale sector width and position on curved and phased array transducers
- Simultaneous mode during PW mode
- Smoothing
- Ability to steer between ±20° steer angle on linear array transducers
- Variance
- Wall filter
- Write priority
- Zoom
- Cineloop review with full playback control
- Advanced motion suppression with intelligent algorithms; adapts to various application types to selectively reduce color motion artifacts
- 256 color bins
- Post-processing includes baseline, color invert, color map, hide color, write priority, blend, variance, and zoom
- Parallelogram steering on linear array transducers; three angles on L12-5 50 and L18-5, thirty-one angles on L12-3, L12-4, and L15-7io
- 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 exam type or is user-selectable
- Velocity and variance displays
- Color invert in live and frozen imaging
- Frequency optimization control for spatial resolution and penetration optimization
- Color and 2D line density control
- Automatically adapts transmit and receive bandwidth processing based on the color box position, providing exceptional sensitivity and color resolution
- Color Doppler PRF maximum 34 KHz, dependent on transducer and clinical application

Color Power Angio imaging (CPA)

- Automatically adapts transmit and receive bandwidth processing based on the color box position providing excellent sensitivity and color resolution
- Highly sensitive mode for small vessel visualization
- Available on all imaging transducers for general imaging and women's healthcare
- Cineloop review
- Multiple color maps
- Individual controls for gain, filters, sensitivity, echo write priority, and color invert
- Adjustable CPA Region of Interest: size and position
- User-selectable persistence
- User-selectable blending on/off
- Cineloop review with full playback control
- Advanced motion suppression with intelligent algorithms; adapts to various application types to selectively eliminate virtually all color motion artifact
- 256 color bins

- Post-processing includes hide CPA, write priority, invert, DCPA map, blend, and zoom
- Parallelogram steering on linear array transducers; three angles on L12-5 50 and L18-5, thirty-one angles on L12-3, L12-4, and L15-7io
- 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 exam type or is user-selectable
- Velocity and variance displays
- Color invert in live and frozen imaging
- Frequency optimization control for spatial resolution and penetration optimization
- Color and 2D line density control
- Automatically adapts transmit and receive bandwidth processing based on the color box position, providing optimal sensitivity and color resolution
- CPA PRF maximum 34 KHz, dependent on transducer and clinical application

MicroFlow Imaging (MFI)

- Highly sensitive imaging mode designed to detect slow and weak blood flow anatomy in tissue

Spectral Doppler

- Display annotations including Doppler mode, scale (cm/sec) Nyquist limit, wall filter setting, gain, acoustic output status, sample volume size, normal/inverted, angle correction, grayscale curve
- Ultra-high resolution millisecond spectral FFT rate
- Angle correction with automatic velocity scale adjustment
- Adjustable velocity display ranges
- Nine position shifts (including 0)
- Normal/invert display around horizontal zero line
- Five selectable sweep speeds: Min, Slow, Medium, Fast, and Max
- Selectable low-frequency signal filtering with adjustable wall filter settings
- Selectable grayscale curve for optimal display
- Selectable Chroma colorization maps
- Selectable display format prospective or retrospective – 1/3-2/3, 1/2-1/2, 2/3-1/3, side-by-side, full screen
- Steering available to up to 90° (+/- 45°), dependent on transducer and clinical application
- Doppler review for retrospective analysis of Doppler data
- 256 (8 bits) discrete gray levels
- Post-processing includes invert, baseline, angle correct, Quick angle, display format, sweep speed, reject, compress, Chroma map
- Available on all imaging transducers
- Adjustable sample volume size: 1.0-20 mm (transducer-dependent)
- Simultaneous or duplex mode of operation
- Simultaneous 2D, color Doppler, pulsed Doppler
- High-PRF capability in all modes including duplex, simultaneous duplex, and triplex
- PRF range between 200 Hz-34 KHz, depending on transducer and clinical application
- 50 dB or more gain available to the user, depending on clinical application
- iSCAN optimization that automatically adjusts scale and baseline

Auto color and Auto Doppler

- In live imaging provides the following capabilities:
  - Automatically adjusts color box position and angle
  - Automatically adjusts PW sample volume placement and angle
  - Includes Auto Flow Tracking for automatic angle correction with sample volume movements
  - Automatically adjusts PW scale and baseline
- When image is frozen and Doppler is active, automatically adjusts PW scale and baseline
- Auto color and Auto Doppler is available on the linear transducers L12-3, L12-4, L12-5 50, VL13-5, L18-5, and L15-7io in carotid/arterial vascular applications
- Auto Doppler is available on the curvilinear transducers C5-1, C6-2, C8-5, C9-2, C9-4v, C10-3v, C10-4ec, BP10-5ec, V6-2

Steerable continuous wave (CW) Doppler

- Available on all cardiac applications using sector transducers
- Steerable through 90° sector
- Maximum velocity range: 19 m/sec (transducer-dependent)
- iSCAN optimization that automatically adjusts scale and baseline

Tissue Doppler Imaging (TDI/TDI PW)

- Available on all cardiac imaging transducers (except S7-3t)
- Frame rate control: high frame rate acquisition of tissue motion (up to 240 fps)
- TDI gain, TGC and LGC compatible
- TDI Opt: optimized transmit and receive frequencies
- Eight maps
- TDI M-mode and TDI-PW available, dependent on transducer and clinical application

Seek Angle echo (X7-2t)

- Ability to image in 2D and rotate the image without moving the transducer
- High frame rate rotational imaging

Live xPlane imaging

- Available on X7-2t xMATRIX transducer
- Simultaneous display of two live imaging planes
- Color and grayscale modes
- Lateral, rotational, and elevation steering

Live 3D echo
- Available on X7-2t xMATRIX transducer
- Live full volume imaging
- High volume rate imaging (HVR)
- ECG display
- Live one-beat, two-beat, four-beat and six-beat
- 3D volume imaging
- Long volume loop acquire in Live 3D
- Beat-by-beat retrospective 3D loop selection
- Live 3D color flow imaging
- High volume rate (HVR) echo and color
- Live 3D zoom and Live 3D zoom preview
- One-beat focused volume
- Half clam shell
- Left and right clam shell switching
- Two volume viewing display
- Crop adjust with cropping
- 3D color flow
- 3D Zoom: 2D and Color
- 3D Zoom: 2D and Color Preview
- Enhanced Live 3D dynamic colorization for enhanced 3D effect
- Full volume sweep
- Adjustable live volume angle control
- Volume rotation using 3D Rotate and Rotate-Z
- Dynamic colorization
- Adjustable vision preset control
- Adjustable center, back, front, volume imaging control
- Maximum 105° by 105° live volume imaging (mode-dependent)
- Support of volume rates up to 90 vps

Live 3D/4D and MPR/iSlice imaging
- Supported on X7-2t xMATRIX transducer
- Volume display with surface rendering (transparency, brightness, and lighting controls)
- Multiplanar reconstruction (MPR) and iSlice view display with QLAB software, including nine simultaneous views from 3D
- Specialized algorithms and maps that increase 3D display
- Cropping tools on volume views with image reference red, green, and blue crop planes, arbitrary plane cropping and ROI-directed cropping with iCrop and FaceCrop
- Two and three 2D reference planes optionally available Live 3D, full volume and 3D zoom imaging, live and review
- Supported XRES modes to reduce noise artifacts
- QuickVue
- AutoView

3D/4D and MPR imaging (hybrid transducers)
- Volume display with surface rendering (transparency, brightness, and lighting controls)
- TrueVue Volume 3D rendering display delivers lifelike image display, allowing the user to place the light source anywhere within the 3D volume
- GlassVue 3D rendering goes beyond the surface, revealing internal structures
- TouchVue is an easier, more intuitive method of 3D volume manipulation – just using simple finger gestures on the system touch panel allows the user to control 3D volume rotation in all axes
- Tilt feature offered on the 3D9-3V provides incremental lateral steering of the 2D image plane to the right or left
- Multiplanar reconstruction (MPR) view display
- Specialized algorithms and maps increase three-dimensional display
- aReveal[A.I.] automatically sculpts away data proximal to the fetal face by recognizing the geometry of the skull
- Cropping tools on both volume and multiplanar reconstruction (MPR) views
- Slice control on MPR and volume displays
- Supported by SonoCT and XRES modes to reduce noise artifacts

Freehand 3D volume and MPR imaging
- Qualitative grayscale volume acquisition supported on all imaging transducers
- Volume display with surface rendering (transparency, brightness, and lighting controls)
- TrueVue Volume 3D rendering display delivers lifelike image display, allowing the user to place the light source anywhere within the 3D volume
- GlassVue 3D rendering goes beyond the surface, revealing internal structures
- TouchVue is an easier, more intuitive method of 3D volume manipulation – just using simple finger gestures on the system touch panel allows the user to control 3D volume rotation in all axes
- Multiplanar view display
- Specialized algorithms and maps increase 3D display
- Trim tools on both volume and multiplanar reconstructed (MPR) views
- aReveal[A.I.] automatically sculpts away data proximal to the fetal face by recognizing the geometry of the skull
- Supported by SonoCT and XRES modes to help reduce noise artifacts
- Resize control that adjusts for different sweep speeds
- On-screen orientation markers

Spatio-Temporal Image Correlation (STIC) imaging
- Available on V6-2 transducer
- Automated volume acquisition of fetal cardiac cycle allowed
- Grayscale and 3D Color
- CPA and Directional CPA (DCPA)
- Default 25° elevation angle
- User-configurable acquisition time
- Ability to stop acquisition and return to standby
- Ability to accept or reject detected heart rate
- Compatible with QLAB quantification software

Panoramic imaging
- Real-time extended field-of-view composite imaging, acquired in fundamental or SonoCT mode
- Ability to acquire composite image in XRES mode
- Ability to back up and realign the image during acquisition
- Full zoom, pan, cineloop review, and image rotation capabilities
- Auto fit of composite image
- Distance, curved-linear distance and area in review mode can be measured with distance marker displayed via skin-line ruler
- Ability to display or remove skin-line ruler
- Cineloop review that allows measurement on individual frames
- Scaling information included for connectivity prints allowing for measurements on a workstation
- Available on linear and curved array transducers (not available on endovaginal transducers)

Contrast imaging – cardiovascular
- System optimized for left ventricular opacification
- One-touch solution (one-button access in Adult Echo preset) with settings for bolus and infusion
- S5-1 broad bandwidth pulse inversion and power modulation technologies for high sensitivity
- LVO on and off, and contrast optimization choices and transmit power settings that can be saved with Gain Save feature for stress echo studies, reducing setup time for image acquisition at peak stress
- Supported on the S4-2 and S5-1

Contrast imaging – general imaging
- System optimized for detecting contrast agent signatures as they are approved for use
- Contrast modes available on C5-1, C6-2, C9-2, C9-4v, C10-4ec, C10-3v, L12-3, L12-4, and L12-5 transducers
- Live MicroVascular Imaging (MVI)
- Mid-MI contrast modes available on C5-1, C9-2 transducers
- Pulse modulation contrast imaging available with SonoCT and XRES technologies
- Touchscreen display timer
- Advanced non-linear pulsing schemes with XRES for increased contrast sensitivity
- High frequency contrast capability
- Flash imaging
- Dual imaging mode for simultaneous fundamental and contrast displays
- ECG/timed triggering
- Long loop capture mode during contrast procedures (3-10 minutes)
- QLAB ROI and MVI display

Interventional imaging
- TSP available on selected transducers for excellent performance during interventional and biopsy procedures
- Biopsy guide selection menus
- Contrast and interventional modes
- Support of multiple biopsy angles on S5-1, C5-1, C6-2, C9-2, V6-2, L12-3, and L12-4

Strain-based elastography
- Strain-based elastography for breast and gynecological imaging
- Available for breast imaging on the L12-5 50 transducer, and on the C10-3v and C9-4v for gynecological and pelvic imaging
- One-touch entry into elastography mode
- Elastogram applied as a Region of Interest box with user control of size and location through entire field of view
- Indicator for compression level
- Display options
- Single-screen 2D with elastogram
- Side-by-side display of 2D image and 2D with elastogram
- Shadow duplication (size compare) and measurement capability in side-by-side display
- Distance and area tools
- Duplication from either side of the display
- Eight selectable elastogram display maps
- Ability to hide or show the elastogram display
- Blend capability to increase 2D visibility through elastogram display
- Four smoothing selections
- Five persistence selections
- Two dynamic resolution system (DRS) selections to alternate between elastogram resolution and penetration
- Four dynamic range selections for elastogram display
- Two elastogram optimization settings for different tissue compositions
- AI – anechoic imaging for enhancing areas without ultrasound signals such as cystic and complex cystic structures
- Stiffness measurement available

Shear wave elastography
- Tissue deformation from special ultrasound push pulses
- Detection pulses used to calculate shear wave velocity
- Available on C5-1 for liver imaging
- Configurable analysis:
  - Pressure (kPa) and velocity (m/s) options available
  - Eight options for individual stiffness sampling
  - IQR (interquartile range) calculation available

3. System controls

Philips common user experience provides readily accessible and logically grouped primary controls along with an easy-to-learn graphical user interface.

3.1 Optimization controls

2D grayscale imaging
- Smart TGC: pre-defined TGC curves optimized for consistently excellent imaging with minimal TGC adjustment
- Lateral gain compensation (LGC) and Smart LGC for cardiac sector transducers
- Adjustable temporal resolution and spatial resolution with DRS control
- Selection between one and eight transmit focal zones
- 16-level digital reconstructed zoom with pan capability
- High definition zoom that concentrates all image processing power into a user-defined area of interest; including HD Zoom Pan, and possible to combine high definition zoom with pan zoom
- Cineloop image review
- Selectable 2D compression settings
- Tissue aberration correction
- Sector size and steering control for sector and curved array image formats
- Selectable 2D line density with DRS control
- Dual imaging with either independent cineloop buffers or split screen imaging
- Dual imaging with color compare
- Dual imaging with fundamental and contrast optimization
- Chroma imaging with multiple color maps
- 256 (8 bits) discrete gray levels
- 2D acquisition frame rate up to 1900 frames/sec (dependent on field of view, depth and angle)
- Live MVI

Next-generation SonoCT real-time compound imaging
- Available on all transducers except sector
- Reduced clutter and artifacts
- Automatic selection of the number of steering angles based on the user-selected resolution/frame rate (Res/Speed) condition
- Up to nine lines of sight automatically adjusted via DRS control
- Operates in conjunction with Tissue Harmonic Imaging, volume modes, panoramic imaging, and duplex Doppler
- Operates in conjunction with XRES
- Available in contrast modes
- Available with WideSCAN format during 2D imaging for extended field-of-view operation

XRES adaptive image processing
- Available on all imaging transducers
- Reduces speckle noise and enhances border definition
- Available in all imaging modes including color flow and Doppler
- Available in contrast modes
- Operates in conjunction with SonoCT imaging
- Provides high resolution algorithms for advanced speckle noise reduction, refined tissue pattern displays, and fine border definition
- Provides high speed processing that allows up to 1900 frames-per-second displays
- Five different levels available, dependent on transducer and clinical application

Live volume imaging (GI/WHC)
- Single sweep 3D, 4D, STIC
- 3D preview ROI size and position
- 3D preview ROI curve adjust
- Sector width
- Angle
- Res/speed control
- Grayscale imaging controls
- 2D optimization settings
- 2D color optimization settings
- 2D power optimization settings
- Tissue Harmonic Imaging
- Rotate X, Y, Z
- Slice
- ROI size and position
- ROI curve adjust
- Pointer trim adjust
- Pointer xHair move
- Pointer cine
- Edit/accept
- Hide volume
- Up/down invert
- QuickFlip
- 3D rotate: 0°, 180°, 90°, 270°
- 3D view control: up, down, left, right, front, back
- Reset orientation
- Magnify
- 3D vision control
- Light position controls (X, Y, and depth with TrueVue, GlassVue, and TouchVue)
- Preset light position controls
- Dynamic volume colorization
- Chroma colorization
- Layout
- Reference
- XRES technology
- Zoom
- Show/hide echo or color
- Reset controls (including light position)
- Pan
- Sculpt
- Threshold

- Brightness
- Smoothing
- Lighting
- Transparency
- xHair display
- Save volume in native or native loop
- Acquisition sweep save
- MPR sweep save
- Generic distance and area measurements available on rendered volumes
- Distance and area measurements on MPRs
- QLAB plugins, including GI 3DQ and FHN

Tissue aberration correction (TAC)
- Automatically enabled when ABD maximum penetration TSP is selected on C5-1 transducer
  - Corrects for speed of sound disturbances due to excessive adipose layer on obese patients
- User selections with the L12-5 50, L18-5 for breast and MSK TSPs
  - Corrects for speed of sound disturbances in fatty tissue

iSCAN intelligent optimization
- One-touch image optimization
  - In 2D mode, one-button automatic adjustment of system gain and TGC to achieve balanced brightness of tissues
- Available in contrast imaging for selected transducers and applications
  - Independent settings based upon whether the contrast timer is active
- In Doppler mode, one-button automatic adjustment of:
  - Doppler PRF based on detected velocity
  - Doppler baseline based on detected flow direction
- Available on all imaging transducers
- Operates in conjunction with SonoCT and XRES imaging
- AutoSCAN continuous automatic optimization
- Adaptive gain compensation (AGC) dynamically adjusts (every pixel on every scan line) low level 2D echoes to reduce gain artifacts (shadows/through transmission) and enhance image uniformity with 2D and 3D imaging

AutoSCAN intelligent optimization
- Continuous, real-time adjustment of system gain and TGC to achieve balanced brightness of tissues
  - When activated, applies gain balancing to all grayscale image data including 2D, 3D, and M-mode grayscale data
  - Every image frame has individually adjusted image brightness
  - Available from 2D touchscreen controls

iOPTIMIZE intelligent optimization

Multiple technologies for one-button approach to automatically and immediately adjust system performance for different patient sizes, flow states, and clinical requirements.

- **Tissue Specific Presets** – adjusts over 7,500 parameters during transducer/application selection
- **Patient optimization** – adjusts 2D performance to immediately adapt to different patient sizes
- **Flow optimization** – adjusts broadband flow performance to immediately adapt to different flow states
- **Dynamic resolution system (DRS)** – one control adjusts nearly 40 parameters simultaneously for user preference of spatial resolution or temporal resolution during clinical procedures
- One control optimizes functions such as:
  - Line density
  - Persistence
  - Pulse inversion harmonics
  - Synthetic aperture
  - Number of lines of sight (SonoCT)
  - RF interpolation
  - Parallel beamforming

3.2 Control panel

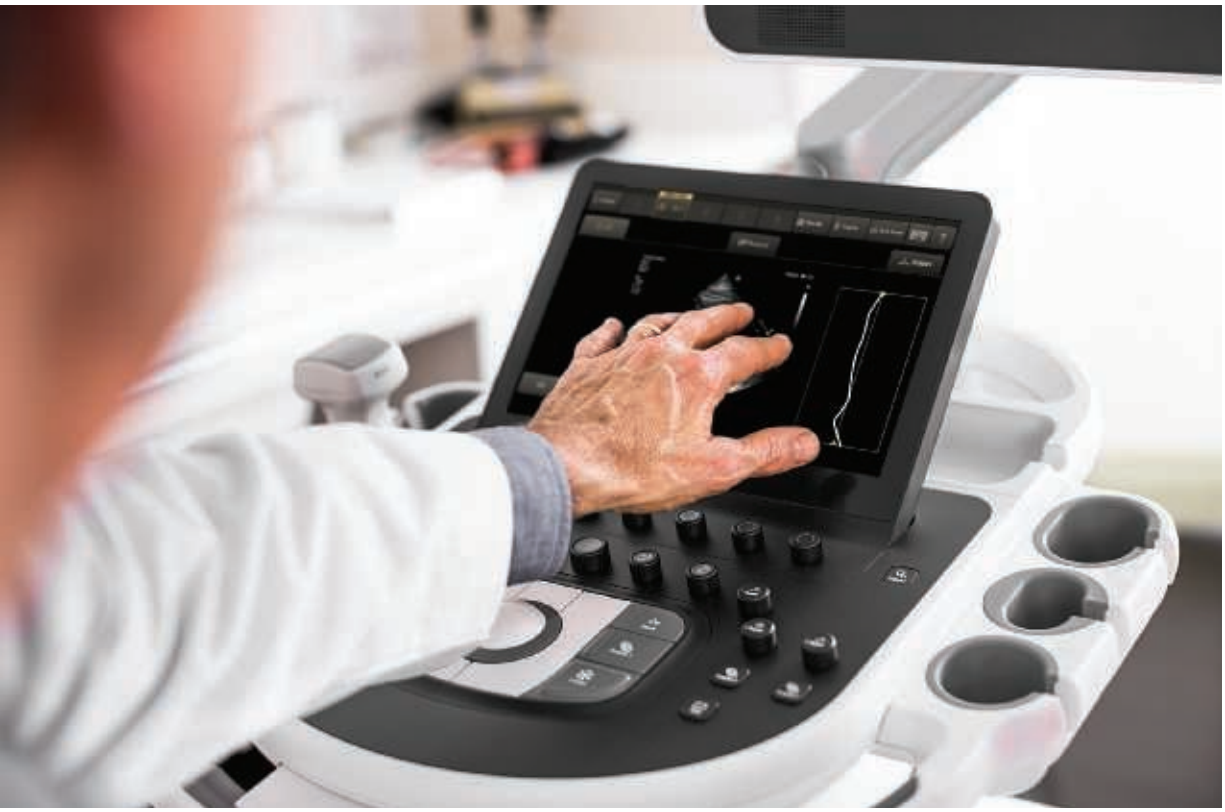
- Easy-to-learn graphical user interface with reduced number of hard controls
- Primary controls concentrated in cluster around trackball
- Tri-state control panel lighting (active, available, and unavailable)
- Ambient lighting control for exceptional image viewing in both light and dark environments
- Full-color 12-inch capacitive touchscreen, complete with swipe technology, enables easy navigation of controls and system interaction
- Dual function mode switch and independent gain controls for 2D, CPA, M-mode, Color, PW, CW Doppler, TDI, and 3D
- Eight-slide pot control adjustment of TGC curve
- iSCAN control for 2D/Doppler automatic optimization
- High definition/pan zoom control
- Dual mode control
- Freeze control
- Three programmable acquire controls

3.3 Touchscreen

- Widescreen touchscreen for dynamic presentation of controls via flyout menu selections; reduces button presses
- Workflow-related controls (Patient, Review, Report, End Exam, Help) always present on touchscreen
- Direct selection of any attached transducer
- Automatic or manual selection of Tissue Specific Presets parameters
- Tabbed layout and swipe capability for quick access to hidden controls
- Touchscreen control adjustment of LGC and TGC curve with simultaneous display of image on touchscreen to enhance ergonomics and reduce user steps
- Touchscreen alphanumeric keyboard for text entry

4. Workflow

The Affiniti 70 ultrasound system features innovative Philips technologies that combine for outstanding performance and efficient workflow.



4.1 Ergonomics

- Advanced control panel design with fewer, clustered controls and easily accessed mode keys to reduce reach
- Tri-state lighting that provides immediate feedback of active, available, and unavailable controls
- Widescreen touchscreen allows more controls to be available at a time
- Touchscreen controls are grouped for quick recognition
- Many touchscreen controls can also be accessed from the main display, allowing user to maintain consistent visual focus
- Independent adjustment of height, rotation, and lateral movement of monitor and control panel allowing enhanced user posture, increasing comfort during exams (meets industry standards recommendation for the prevention of WRMSD)
- Highly mobile cart that facilitates portable exams and positioning in confined space environments

4.2 Display annotation

- On-screen annotation of all pertinent imaging parameters for complete documentation, including transducer type and frequency, active clinical options and optimized presets, display depth, TGC curve, grayscale, color map, frame rate, compression map value, color gain, color image mode, hospital name, and patient demographic data
- User-selectable display of patient birth date, patient gender, institution name, system name, and user
- Fixed position title area for consistent annotation
- Patient name, ID, birth date, gender, and system date that can be turned off (hidden) for generating still images for publication
- Additional patient information can be displayed on demand
- Sector steering icon for endocavitary transducers
- Scan plane orientation marker
- User-selectable depth scale display
- Real-time display of mechanical index (MI)

- Real-time display of thermal index (TIb, TIc, TIs)
- Multiple trackball-driven annotation arrows
- Pre-defined annotations and body markers (application-specific and user-selectable), with two body markers supported in dual imaging format
- Doppler baseline invert in live and frozen imaging
- Compression changes available live or scrolling loop
- TGC curve (On/Auto/Off display)
- TGC values (On/Off display)
- Tool Tips provides a brief description of the abbreviated on-screen image parameters
- Trackball icon displaying functions assigned to trackball buttons
- Informative trackball arbitration prompts
- Thumbnail display of images printed/stored
- On-screen selection and display of calculations
- On-screen selection and editing of protocols
- Calculations results and analysis labels
- Graphical tabs that allow navigation to other analysis features
- Network and connectivity icons to allow immediate feedback about network and printer conditions
- Icons to display status of and/or allow access to the following functions: Print Job status, media read/write status, battery level, wireless connectivity, remote service, microphone, HIPAA status indicator icon, iSCAN status, acquisition status, physio status
- Cineloop frame number display
- Cineloop bar with trim markers
- Prompt region for display of informational text and icons
- Trackball icon displaying functions assigned to trackball buttons
- Contrast specification
- Protocol procedure list with status

4.3 SmartExam protocols

- On-screen selection and editing of protocols
- Exam guide with on-screen display
- Required views based on exam type
- SmartExam customization
  - Creates a protocol as the user performs an exam
  - Saves all annotation, body markers, and labeled measurements defined in each view
  - Records modes used to capture each view
  - Captures the acquisition method (print, capture, 3D data set) in each individual view
  - Provides user ability to pause and resume recording process if needed
  - Allows user to edit views before finalizing new protocol
- Fully customizable protocol capability for any clinical application supported on the system with flexibility to conduct the examination protocol in any sequence
- Preset protocols including but not limited to abdominal, vascular, cardiac, and Ob/Gyn exams based on industry and accreditation guidelines
- Automatic launching of annotation and body marker icon on required views
- Ability to automatically launch modes (2D, 3D, color modes, Doppler, dual, color compare) defined in a SmartExam
- Ability to pause and resume SmartExam function at any time
- System analysis capabilities supported in all defined protocols

4.4 Stress echo

- Acquisition of echocardiography single frame or loops of the left ventricle in any imaging mode including 2D, color, and spectral Doppler
- Gain Save that adjusts automatically to different views and automatically saves your preferred control settings, such as gain, depth, ROI, position, and many other parameters:
  - For each view while acquiring resting images
  - At immediate post-exercise, automatic retrieval of saved settings for each view
  - Different gain profiles for parasternal LAX and SAX views, AP4 and AP2 views allowed
- Length of acquired images that is user-adjustable between 1 and 180 seconds
- Ability to acquire routine cardiac images in timed and R-R interval clip (varies with selected compression ratio and available system memory)
- For timed acquisition, the ability to start acquisition on the R-wave if the ECG is active and an R-wave is present
- Your preferred control settings automatically saved – such as MI (mechanical index), gain and depth for each view while acquiring resting images
- Live Compare
- Ability to defer selection by stage
- Default stress protocols
  - Factory-provided non-editable default protocols include:
    - Two-stage exercise stress
    - Four-stage pharmacological stress
    - Three-stage exercise stress (bicycle)
    - Four-stage quantitative: wall motion and contrast
- Default protocols that may be used as the basis for user-defined versions
  - Support between 1 and 10 stages
  - Support user-defined stage names
  - Support between 1 and 40 views per stage
  - Support user-defined view names
  - Prompt for a particular stage and view
  - Assign stage and view names
  - Set clip length for each image or group of images
  - Set the number of cycles/beats for each image
  - Define prospective, retrospective, or multi-cycle/full disclosure acquisition
  - Define the capture format of each image or group of images
  - Define the default replay mode for each protocol
  - Set mode acquisition for each view
  - Support for up to five modes
  - Save user-defined protocols within a preset

  - Save user-defined protocols to removable media for import onto separate systems at the same software level
  - Modify protocols during use
  - Add stages at any point after the current stage
  - Pre and post data curves
  - Pre and post bullseye maps
  - Pre and post strain comparisons
- aBiometry Assist[A.I.] utilizes anatomical intelligence technology for automatic measurements of the most commonly used fetal biometry parameters BPD, OFD, HC, AC, and FL

4.5 Volume imaging solutions for connected radiology departments

- Customizable to your workflow
- Fast, one-button press volume acquisition and on-cart review
- Advanced volume and MPR visualization with QLAB GI 3DQ
  - iSlice and thick slice on cart
  - Capability to export freehand, electronic, and hybrid acquired 3D grayscale data for visualization on most PACS in a stacked "fly-through" manner (like CT/MR)
  - Off-cart evaluation of volume data on a multimodality clinical workstation
  - Powerful 3D manipulation tools including volume rendering, MPR, MIP, slab viewing (thick slice), 3D orientation graphics
  - Advanced 3D visualization with QLAB GI 3DQ including ability to handle 3D color flow
  - Orientation labels feature for spatial orientation of 3D data sets
  - Adult orientation labels for non-fetal applications
  - Fetal orientation labels for fetal applications
- MPR export capability
  - Ability to export A, B, and C planes as a multiframe loop for review on a DICOM device
  - Available on all transducers, but not supported for any STIC files

4.6 Anatomical Intelligence for Breast (AI Breast)

AI Breast is a fully integrated screening, diagnostic and workflow tool for whole breast ultrasound, that utilizes Philips unique Anatomical Intelligence and the new eL18-4 EM ultra-broadband linear transducer. The system provides the ability to automatically track and document the transducer position relative to the patient's breast during image acquisition.

- Auto Annotate – automatically adds annotation indicating transducer position in relation to the body mark during breast scanning
- Coverage Assistant: unique tracking technology maps 2D projection of breast tissue covered in real time to enable new levels of confidence during breast screening and diagnostic exams
- Bookmark key images during acquisition for quick review
- Find Orthogonal – the system automatically finds images that are orthogonal from the reference point, for fast comparison and diagnosis
- Reverse lookup – the system finds frames near defined targets by clicking on the position in the corresponding breast body mark graphic
- Available with integrated electromagnetic tracking on the eL18-4 and external electromagnetic tracking on the L12-5

4.7 QuickSAVE feature

- The system provides the ability to quickly save preferred system settings as individual exam types
- Over 40 QuickSAVE exams can be created per transducer
- Saved parameters include virtually all imaging parameters as well as color box size
- QuickSAVE exams can be copied to USB/DVD and transferred to other systems of like configuration

4.8 Image presentation

- Up/down
- Left/right
- Multiple duplex image formats (1/3-2/3, 1/2-1/2, 2/3-1/3, 50/50 and full screen)
- MaxVue image format
  - Allows use of entire monitor viewing area for displaying image with a push of a button
  - Uses a high-definition resolution and an aspect ratio of 16:9
- Depth from 1 cm to 40 cm (transducer-dependent)

4.9 Cineloop review

- Acquisition, storage in local memory, and display in real-time and duplex modes of up to 2,200 frames of 2D and color images, up to 64 seconds of Doppler data and M-mode for retrospective review and image selection, or up to 48 seconds CW for retrospective review and image selection
- Prospective or retrospective loop acquire "accept" prior to store or clip store
- Trackball control of image selection
- Variable playback speed
- Trim capability of 2D data
- Available in all imaging modes plus:
  - Panoramic imaging
  - 3D imaging
  - Independent control of 2D image or spectral data in duplex mode
  - Simultaneous control of 2D and spectral data in simultaneous mode
- On-screen display of current 2D frame number
- Many controls available in cineloop review for post-processing, such as 2D gain, dynamic range/compress, XRES, magnify zoom

4.10 Exam management features

- Internal storage
- Data export
- Temporary ID feature
  - One-click start of exam from patient data entry screen with system-provided information
  - Storage of images that were created without a patient name with a temporary identification
  - Patient identification via bar code reader

Rapid Procedure Setup

- With a single selection, choose transducer, preset, study type, study description, and optionally gender
- Procedure definitions are built-in for built-in study types
- Additional procedure definitions may be added by the user
- Procedure may be automatically selected based on modality Worklist scheduled procedure information

4.11 Connectivity

Standard connectivity features

- Digital image acquisition and on-board patient exam storage
  - Direct digital storage of B/W and color loops to internal hard disk drives
  - Combined 512 GB storage capacity
  - Storage capacity of approximately 350 patient exams (assuming 40 images, 6 seconds of clips/reports per exam)
  - Fully integrated user interface
  - User-configurable “auto delete” capability
  - On-screen recall, measurement, and text editing
  - Exam directory
  - Append exam
    - To existing study
    - To new study using existing patient information
- Data types
  - 2D, M-mode, Doppler spectral frame acquisition
  - 2D clip acquisition up to 2,200 frames per clip
  - Scrolling M-mode, Doppler acquisition
  - Cartisian volume acquisition: 3D, 4D, STIC
  - Cardiac temporal volume acquisition: Live 3D, full volume 3D
  - 3D clips: volume render views and MPR views
  - Q-Apps frames and clips
- Printing
  - Local print to on-board or off-board video printers
  - Printing of images in configurable N-up format to local plain paper printers
  - Page report print
  - DICOM grayscale or color print
- Media storage and retrieval
  - Export DICOM Image and structured report export to removable media
  - Export PC format image export to removable media
  - Export PDF report to removable media
  - Supported media
    - Read and write (single session) to CD (CD+R)
    - DVD read-only (DVD+R)
    - DVD read + write (single session) (DVD+RW)
    - USB storage (flash memory or hard drives)
    - Export PC format images and loops to network share
    - Export PDF report to network share
  - DICOM image import
    - Ultrasound images
    - Multimodality images (CT/MRI/X-Ray/Mammography/PET)
  - OB trending data
    - Export OB trending information via USB storage device
    - Import OB trending information via USB storage device
    - Export and import of trending data is compatible with iU22
- RS-232 serial storage
  - Export of report data to off-line analysis computer programs
- Basic networking connectivity
  - Wired gigabit Ethernet
  - Wireless networking 802.11n
    - WPA2 Personal security
    - WPA2 Enterprise security
  - Network addressing
    - IPV4 addressing: static or DHCP for system address, static or hostnames (DNS lookup) for server addresses
    - IPV6 addressing: link local, router discovery, or DHCP for system address, hostnames for server addresses
- Compatibility with OmniSphere’s data analytics and connectivity tools (applications sold separately)
  - Scheduled export of log files for use with the Utilization Optimizer application
  - On-cart service request for use with Remote Technical Connect applications
  - In-house technical support tool via the Remote Technical Connect application

NetLink connectivity option

- Supported DICOM services
  - Image storage
  - Structured Report (SR) storage includes Ob/Gyn, vascular, adult echo, pediatric echo, fetal echo, congenital cardiology
  - Modality Worklist with automatic patient demographic entry
  - Modality Performed Procedure Step (MPPS)
  - Storage commitment push model
  - Query/retrieve of ultrasound images (study-root)
- Image and structured report export to network storage servers
  - Send images after each Print/Acquire
  - Send images at End of Exam (batch send)
  - Send images and report on-demand during exam
  - Send images or exams manually
  - Send to up to 5 storage SCPs concurrently (at End Exam or after each Print/Acquire)
  - Independently configurable destinations for each acquisition control (e.g., Acquire1, Acquire2, Save 3D, etc.)
- DICOM compression options
  - Uncompressed (Explicit VR Little Endian, Implicit VR Little Endian)
  - JPEG lossy compression (loops) with configurable quality factor 60-100
  - RLE lossless compression
  - JPEG lossless compression (frames)
- Other DICOM export options
  - Monochrome or true color
  - Configurable image size/loop export 640 x 480 or 800 x 600 or 1,024 x 768
  - Secure DICOM configurable
  - Grayscale mapping choices
    - DICOM Grayscale Standard Display Function (GSDF)
    - 25 additional grayscale curves, user-selectable
  - Export optimization tool to aid user in evaluating PACS display monitor calibration and in selecting which grayscale curve to use for exported images
  - Native data attached to DICOM ultrasound images (lossless compressed)
    - 2D native data types: tissue, flow, tissue Doppler, spectral Doppler, M-mode, and elastography
    - 3D volume data including crop, resize, gain, compression, colorize, color suppress, B/W suppress, XRES and 3D quantification
  - Ultrasound region calibration (standard for ultrasound images)
  - Pixel spacing attribute for measurement calibration (optional)
  - DICOM query/retrieve of other modality images (CT/MRI/X-ray/mammography/PET)
  - De-identification feature
  - Send images to PACS and media without identifying information burned in to the image
  - Images exported to media may optionally have patient information removed from DICOM attributes or PC format names
  - All pages sent to DICOM printer have patient identification overlay – not configurable
- All pages sent to local printers are configurable to include or exclude patient identification overlay
- DICOM mapping for user-defined measurements, calculations, and OB authors
- Support of the export of user-defined measurements, calculations, and OB authors with standard DICOM structure reporting for:
  - Adult echo
  - Pediatric echo
  - Fetal echo
  - Ob/Gyn
  - Vascular
  - TCD
  - Abdominal
  - Small Parts

Report

- Report templates per clinical exam
- User-configurable report
- Off-cart report configuration tool available
- On-cart report configuration

Government security option

Configurable option to provide up-to-date security features while fully hardening the system for patient data protection. Option also fully removes the capability for creating or configuring any VPN functionality.

- Antivirus protection
- Malware protection
- In-memory protection
- USB/DVD protection
- Internet firewall protection
- OS security
- Custom-configurable password

SafeGuard security option

Configurable option for enabling state-of-the-art computer protection against virus or malware for maximum network protection

- Antivirus protection
- Malware protection

Security Plus option

- Hard drive encryption
- LDAP user authentication
- Custom-configurable password policies

5. Transducers

5.1 Transducer selection

- Electronic switching of transducers using four universal connectors
- Dedicated (Pedoff) continuous wave Doppler connector is available
- Automatic parameter optimization of each transducer for exam type through Tissue Specific Presets (TSP) software
- If two transducers are connected that both support the same TSP, the system supports instantaneous switching between transducers while maintaining current depth parameter if possible
- User-customizable imaging presets for each transducer
- Automatic dynamic receive focal optimization
- Transmission of focal characteristics automatically controlled through TSP, focal control, and DRS functions

Compact transducers

- Ergonomic designs with lightweight super-flexible cables
- Virtually pinless micro connectors
- Advanced low-loss lens technology for penetration with less artifacts
- Breakthrough broadband frequency response
- Support for very high frequencies up to 20 MHz and depths from skin line (with zoom function) to 30 cm
- Advanced micro-electronics in linear, curved, tightly curved, sector, and hybrid volume array configurations
- High-precision automated volume transducers

PureWave crystal technology

- Available on the X7-2t, S5-1, C5-1, C9-2, and C10-3v transducers
- Breakthrough crystal technology that allows greater acoustic efficiency and bandwidth

Curved array

C10-3v broadband curved array with PureWave crystal technology

- 10 to 3 MHz extended operating frequency range
- End-fire sector, 11.5 mm radius of curvature, 163° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), directional CPA, SonoCT, XRES, and harmonic imaging
- Endocavitary applications, including urology
- Elastography – strain-based
- Contrast mode
- Supports biopsy guide capabilities

C9-4v broadband curved array

- 9 to 4 MHz extended operating frequency range
- End-fire sector, 10 mm radius of curvature, 181° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), directional CPA, SonoCT, XRES, and harmonic imaging
- Endocavitary applications, including urology
- Elastography – strain-based
- Contrast mode
- Supports biopsy guide capabilities

C10-4ec broadband curved array

- 10 to 4 MHz extended operating frequency range
- End-fire sector, 8 mm radius of curvature, 147° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), directional CPA, SonoCT, XRES, and harmonic imaging
- Endocavitary applications, including vaginal and rectal
- Contrast mode
- Supports biopsy guide capabilities

BP10-5ec broadband curved array

- 10 to 5 MHz extended operating frequency range
- End-fire bi-plane sector, 8.8 mm radius of curvature, 150° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), directional CPA, SonoCT, variable XRES, and harmonic imaging
- Rectal urology applications
- Supports biopsy guide capabilities

C9-2 broadband curved array with PureWave crystal technology

- 9 to 2 MHz extended operating frequency range
- End-fire sector, 45 mm radius of curvature, 102° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), directional CPA, SonoCT, variable XRES, and harmonic imaging
- General purpose obstetrical and gynecological, small adult, and pediatric abdominal applications
- Contrast mode
- Supports biopsy guide capabilities (4 angle)
- Precision biopsy support compatible with CIVCO Verza Guidance System[1]

C8-5 broadband curved array

- 8 to 5 MHz extended operating frequency range
- End-fire sector, 14 mm radius of curvature, 122° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), directional CPA, SonoCT, and XRES imaging
- Vascular, pediatric abdominal, and neonatal cephalic imaging
- Supports biopsy guide capabilities

1. CIVCO Verza Guidance System is a trademark of CIVCO Medical Solutions.

C5-1 broadband curved array with PureWave crystal technology

- 5 to 1 MHz extended operating frequency range
- End-fire sector, 45 mm radius of curvature, 111° field of view (wide scan enabled)
- High density curved array with 160 elements
- Steerable pulsed, High-PRF, and color Doppler; and Color Power Angio (CPA), directional CPA, SonoCT, variable XRES, and mulitvariate harmonic imaging
- General purpose abdominal (adult and pediatric, including vascular), bowel, obstetrical, gynecological, prostate and interventional applications
- Intervention application
- Elastography – shear wave
- Contrast mode
- Supports biopsy guide capabilities
- Precision biopsy support compatible with CIVCO Verza Guidance System[1]

C6-2 broadband curved array

- 6 to 2 MHz extended operating frequency range
- End-fire sector, 50 mm radius of curvature, 72° field of view (wide scan enabled)
- High density curved array with 128 elements
- Steerable pulsed, High-PRF, and color Doppler; and Color Power Angio (CPA), directional CPA, SonoCT, variable XRES, and mulitvariate harmonic imaging
- General purpose abdominal (adult and pediatric, including vascular), bowel, obstetrical, gynecological, prostate, and interventional applications
- Intervention application
- Contrast mode
- Supports biopsy guide capabilities

Volume array

V6-2 broadband curved array

- 6 to 2 MHz extended operating frequency range
- End-fire sector, 55 mm radius of curvature, 89° field of view (wide scan enabled)
- Steerable pulsed wave, High-PRF, and color Doppler; Color Power Angio (CPA), Directional CPA, SonoCT, variable XRES, harmonic imaging, and STIC
- Support of high resolution 2D imaging
- Support of high resolution, quantitative, single sweep 3D volume acquisition
- Support of 4D imaging up to 36 volumes per second
- Comprehensive obstetrical volume applications
- Supports biopsy guide capabilities

3D9-3v broadband curved array

- 9 to 3 MHz extended operating frequency range
- 164° field of view (wide scan enabled)
- Steerable pulsed wave and color Doppler, Color Power Angio, Directional CPA, SonoCT, XRES, and harmonic imaging
- Support of high resolution 2D imaging
- Support of high resolution, quantitative, single sweep 3D volume acquisitions (hybrid and freehand)
- Support of 4D imaging up to 11 volumes per second
- Endovaginal obstetrical and GYN applications
- Supports biopsy guide capabilities

VL13-5 broadband linear array

- 13 to 5 MHz extended operating frequency range
- Fine pitch, 192 element, high resolution linear array
- Steerable pulsed wave and color Doppler, Color Power Angio, SonoCT, XRES, and harmonic imaging
- Support of high resolution 2D imaging
- Support of high resolution, quantitative, single sweep 3D volume acquisition
- Support of 4D imaging
- High resolution superficial applications including small parts, breast, and vascular imaging
- Tissue aberration correction selection for advanced breast imaging TSP
- Supports biopsy guide capabilities

Linear array

eL18-4 ultra-broadband linear array with PureWave crystal technology

- Ultra-broadband PureWave array generates frequencies from 2 to 22 MHz
- Multi-row array with fine elevation focusing
- Optimized diagnostic operating bandwidth: 18-4 MHz
- Fine pitch, 1920 active elements
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, variable XRES, and harmonic imaging
- High resolution superficial applications including small parts, breast, vascular, musculoskeletal, bowel, pediatric, and OB imaging
- Tissue aberration correction selection for advanced MSK, breast, and vascular venous TSP
- MicroFlow Imaging support
- Full solution elastography support
- Needle visualization support
- Auto Doppler flow optimization
- Contrast mode
- Panoramic Imaging
- High frame rates available
- Precision biopsy support compatible with CIVCO Verza Guidance System[1]

eL18-4 EM ultra-broadband linear array with PureWave crystal technology

- Ultra-broadband PureWave array generates frequencies from 2 to 22 MHz
- Multi-row array with fine elevation focusing
- Optimized diagnostic operating bandwidth: 18-4 MHz
- Fine pitch, 1920 active elements
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, variable XRES, and harmonic imaging

1. CIVCO Verza Guidance System is a trademark of CIVCO Medical Solutions.

- High resolution superficial applications including small parts, breast, vascular, musculoskeletal, bowel, pediatric, and OB imaging
- Tissue aberration correction selection for advanced MSK, breast, and vascular venous TSP
- MicroFlow Imaging support
- Full solution elastography support
- Needle visualization support
- AI Breast support with integrated electro-magnetic tracking
- Auto Doppler flow optimization
- Contrast mode
- Panoramic Imaging
- High frame rates available
- Precision biopsy support compatible with CIVCO Verza biopsy guide capabilities (up to 5 angles)

L18-5 broadband linear array

- 18 to 5 MHz extended operating frequency range
- Ultra-fine pitch, 288 element, high resolution linear array
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, panoramic, variable XRES, and harmonic imaging
- High resolution superficial applications including small parts, breast, vascular, and musculoskeletal imaging
- Tissue aberration correction selection for MSK and breast imaging TSP
- Auto Doppler flow optimization
- Supports biopsy guide capabilities
- Precision biopsy support compatible with CIVCO Verza Guidance System[1]

L15-7io broadband compact linear array

- 15 to 7 MHz extended operating frequency range
- Fine pitch, 128 element, high resolution linear array
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, panoramic, and XRES imaging
- Unique lens design allowing high resolution imaging at transducer surface
- High resolution intraoperative vascular, epiaortic, and superficial (MSK and small parts) applications
- Auto Doppler flow optimization
- Fine angle steering of color and pulsed wave Doppler

L12-5 50 broadband linear array

- 12 to 5 MHz extended operating frequency range
- Fine pitch, 256 element, high resolution linear array
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, variable XRES, and harmonic imaging
- High resolution superficial applications including small parts, breast, vascular, musculoskeletal, and bowel imaging
- Tissue aberration correction selection for advanced MSK and breast imaging TSP
- Auto Doppler flow optimization
- Elastography – strain-based
- Contrast mode
- Panoramic imaging
- Pediatric application
- High frame rates available
- Supports biopsy guide capabilities
- Precision biopsy support compatible with CIVCO Verza Guidance System[1]

L12-3 broadband linear array

- 12 to 3 MHz extended operating frequency range
- Fine pitch, 160 element, high resolution linear array
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, panoramic, variable XRES, and harmonic imaging
- Fine angle steering of color and pulsed wave Doppler
- Vascular (carotid, arterial, and venous), intervention, bowel, MSK and small parts, and superficial imaging applications
- Cerebrovascular (carotids, vertebrals), peripheral vascular (venous, arterial), internal mammary vessels, and musculoskeletal imaging
- Surgical application
- Auto Doppler flow optimization
- Supports biopsy guide capabilities
- Precision biopsy support compatible with CIVCO Verza Guidance System[1]

Transducers with compact connectors

Ergonomic designs with lightweight super-flexible cables.

Specifically for cardiovascular applications.

Full range for general imaging applications.

Designed for women's healthcare applications.

1. CIVCO Verza Guidance System is a trademark of CIVCO Medical Solutions.

L12-4 broadband linear array
- 12 to 4 MHz extended operating frequency range
- Fine pitch, 128 element, high resolution linear array
- Steerable pulsed wave and color Doppler, Color Power Angio (CPA), SonoCT, panoramic, variable XRES, and harmonic imaging
- Fine angle steering of color and pulsed wave Doppler
- Vascular (carotid, arterial, and venous), intervention, bowel, MSK and small parts, and superficial imaging applications
- Cerebrovascular (carotids, vertebrals), peripheral vascular (venous, arterial), internal mammary vessels, and musculoskeletal imaging
- Surgical application
- Auto Doppler flow optimization
- Supports biopsy guide capabilities

Sector array

S4-2 broadband sector array
- 4 to 2 MHz extended operating frequency range
- Phased array, 80 elements
- 2D; CW, steerable pulsed wave, High-PRF and color Doppler; tissue Doppler, variable XRES, AutoSCAN/iSCAN, and harmonic imaging
- Adult echo, abdominal, pediatric echo, and TCD applications
- Contrast mode

S5-1 broadband sector array with PureWave crystal technology
- 5 to 1 MHz extended operating frequency range
- Phased array, 80 elements
- 2D; CW, steerable pulsed wave, High-PRF and color Doppler; tissue Doppler, variable XRES, AutoSCAN/iSCAN, and harmonic imaging
- Adult echo, abdominal, pediatric echo, and TCD applications
- Contrast mode

S8-3 sector array
- 8 to 3 MHz extended operating frequency range
- Phased array, 96 elements
- 2D, steerable PW Doppler, CW Doppler, High-PRF Doppler, color Doppler, tissue Doppler, advanced variable XRES, and harmonic imaging
- Adult, fetal, and pediatric echo cardiac applications; pediatric abdomen; neonatal head application

S12-4 sector array
- 12-4 MHz extended operating frequency range
- Phased array, 96 elements
- 2D, steerable PW Doppler, CW Doppler, High-PRF Doppler, color Doppler, tissue Doppler, advanced variable XRES, and harmonic imaging
- Pediatric cardiac applications, neonatal head application

S7-3t sector array TEE
- 7 to 3 MHz extended operating frequency range
- Transesophageal sector array with 48 elements
- 2D, steerable PW Doppler, CW Doppler, color Doppler, variable XRES, and harmonic imaging
- Physical dimensions:
  - Tip: 10.7 x 8 x 27 mm (0.42 x 0.31 x 1.1 in)
  - Shaft: 7.4 mm (0.29 in) diameter, 70 cm (27.6 in) L
- Manually rotatable array from 0° to 180°
- Pediatric and adult TEE applications: patients > 3.5 kg (7.7 lb)

S8-3t sector array TEE
- 8 to 3 MHz extended operating frequency range
- Transesophageal sector array with 32 elements
- Physical dimensions:
  - Tip: 7.5 x 5.5 x 18.5 mm (0.3 x 0.2 x 0.7 in), WHL
  - Shaft: 5.2 mm (0.2 in) diameter, 88 cm (34.6 in) L
- Manually rotatable array from 0° to 180°
- 2D, steerable PW Doppler, CW Doppler, color Doppler, advanced XRES, M-mode, and harmonic imaging
- Pediatric, including infants, and adult TEE applications: patients > 2.5 kg (5.5 lb)

X7-2t xMATRIX array TEE with PureWave technology
- 7 to 2 MHz extended operating frequency range
- Transesophageal xMATRIX array transducer with 2,500 elements
- 2D, advanced variable XRES, harmonic imaging, M-mode, color M-mode, color flow, PW Doppler, CW Doppler, Live xPlane imaging, Live 3D Echo, Live 3D zoom, 3D zoom color, 3D zoom color preview, two-volume view, triggered full volume and triggered 3D color volume
- Physical dimensions:
  - Tip: 1.7 x 3.8 cm (0.7 x 1.5 in) WxL
  - Shaft: 1 cm (0.4 in) diameter, 1 m (39.4 in) L
- Electronically rotatable array from 0° to 180°
- Electrocautery suppression
- Adult TEE applications: patients > 30 kg (66 lb)

Non-imaging

D5cwc CW transducer (Pedoff)
- Dedicated 5 MHz continuous wave Doppler
- Deep venous and arterial applications

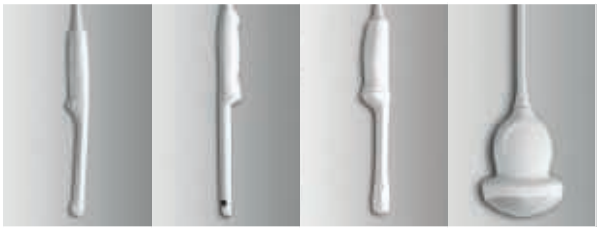
D2cwc CW transducer (Pedoff)
- Dedicated 2 MHz continuous wave Doppler
- Adult cardiology applications

D2tcd PW transducer (Pedoff)
- Dedicated 2 MHz pulsed wave Doppler
- Transcranial Doppler applications

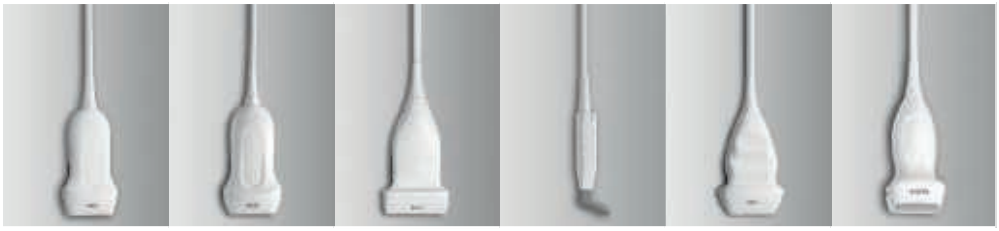
5.2 Transducer application guide

Transducer – Sector		S4-2	S5-1	S8-3	S12-4	S7-3t	S8-3t	X7-2t
Type of array		Sector	Sector	Sector	Sector	Sector	Sector	xMATRIX
Number of elements		80	80	96	96	48	32	2500
Scanplane aperture		20.3 mm	20.3 mm	15.4 mm	9.78 mm	5 mm	4.76 mm	Proprietary
Field of view		90˚	90˚	90˚	90˚	90˚	90˚	90˚
WideSCAN available								
Volume field of view								
Broadband frequency range		4-2 MHz	5-1 MHz	8-3 MHz	12-4 MHz	7-3 MHz	8-3 MHz	7-2 MHz
PureWave technology			•					•
Application	**Exam type**							
Abdominal	General							
	Renal							
	Bowel							
	Vascular	•	•					
	Penetration							
	Resolution							
	Intervention							
Obstetrics	Early OB							
	General OB							
	NT							
	Penetration							
Fetal	Early fetal heart							
	Fetal heart			•				
Gynecology	Pelvis							
	Fertility							
	Penetration							
Cardiology	Adult	•	•	•		•	•	•
	Pediatric	•	•	•	•	•	•	
	Epicardial							
	Epiaortic							
Vascular	Carotid							
	Arterial							
	Venous							
	TCD	•	•					
	Intraoperative							
	Intervention							
	Superficial							
Pediatric	Abdomen			•	•			
	Hip							
	Neonatal cephalic			•	•			
Small parts	Superficial							
	General							
	Thyroid							
	Testicle							
	Breast							
Musculoskeletal	Superficial							
	General							
Urology	Prostate							
	Bladder							
	Renal							
Biopsy guide		•	•					

Transducer – Curved		C5-1	C6-2	C8-5	C9-2	C10-3v	C10-4ec
Type of array		Curved	Curved	Tightly curved	Curved	Tightly curved	Tightly curved
Number of elements		160	128	128	192	128	128
Scanplane aperture		55.5 mm	63.7 mm	22.4 mm	53.76 mm	26.1 mm	24.3 mm
Field of view		111˚	72˚	122˚	102˚	163˚	147˚
WideSCAN available							
Volume field of view							
Broadband frequency range		5-1 MHz	6-2 MHz	8-5 MHz	9-2 MHz	10-3 MHz	10-4 MHz
PureWave technology		•			•	•	
Application	**Exam type**						
Abdominal	General	•	•		•		
	Renal	•	•		•		
	Bowel	•	•		•		
	Vascular	•	•		•		
	Penetration	•	•		•		
	Resolution	•			•		
	Intervention	•	•				
Obstetrics	Early OB	•	•		•	•	•
	General OB	•	•		•	•	
	NT	•	•		•		
	Penetration	•	•				
Fetal	Early fetal heart				•		
	Fetal heart	•	•		•	•	•
Gynecology	Pelvis	•	•		•	•	
	Fertility	•	•		•	•	
	Penetration					•	
Cardiology	Adult						
	Pediatric						
	Epicardial						
	Epiaortic						
Vascular	Carotid			•			
	Arterial			•			
	Venous			•			
	TCD						
	Intraoperative						
	Intervention						
	Superficial						
Pediatric	Abdomen	•	•	•	•		
	Hip						
	Neonatal cephalic			•			
Small parts	Superficial						
	General						
	Thyroid						
	Testicle						
	Breast						
Musculoskeletal	Superficial						
	General						
Urology	Prostate	•	•				•
	Bladder					•	
	Renal						
Biopsy guide		•	•	•	•	•	•

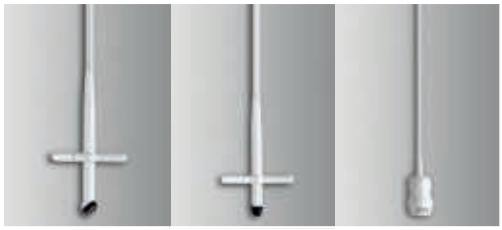


Transducer – Curved		C9-4v	BP10-5ec	3D9-3v	V6-2	Linear	eL18-4	eL18-4 EM
Type of array		Tightly curved	Tightly curved	Tightly curved	Curved		Linear	Linear
Number of elements		128	96	128	192		1920	1920
Scanplane aperture		26.2 mm	19.6 mm	26.1 mm	63.4 mm		50 mm	50 mm
Field of view		181˚	150˚	130˚				
WideSCAN available							•	•
Trapazoid available							•	•
Volume field of view			127˚ on each biplane array	156˚ x 85˚	100˚ x 85˚			
Broadband frequency range		9-4 MHz	10-5 MHz	9-3 MHz	6-2 MHz		2-22 MHz	2-22 MHz
PureWave technology							•	•
Application	**Exam type**							
Abdominal	General							
	Renal							
	Bowel						•	•
	Vascular							
	Penetration							
	Resolution							
	Intervention							
Obstetrics	Early OB	•		•	•			
	General OB	•			•		•	•
	NT				•			
	Penetration							
Fetal	Early fetal heart							
	Fetal heart	•		•	•		•	•
Gynecology	Pelvis	•		•				
	Fertility	•						
	Penetration	•		•				
Cardiology	Adult							
	Pediatric							
	Epicardial							
	Epiaortic							
Vascular	Carotid						•	•
	Arterial						•	•
	Venous						•	•
	TCD							
	Intraoperative							
	Intervention							
	Superficial							
Pediatric	Abdomen						•	•
	Hip						•	•
	Neonatal cephalic							
Small parts	Superficial						•	•
	General							
	Thyroid						•	•
	Testicle						•	•
	Breast						•	•
Musculoskeletal	Superficial						•	•
	General						•	•
Urology	Prostate		•					
	Bladder	•	•	•				
	Renal							
Biopsy guide		•	•	•	•			



Transducer – Linear	L12-3	L12-4	L12-5	L15-7io	L18-5	VL13-5
Type of array	Linear	Linear	Linear	Linear	Linear	Linear
Number of elements	160	128	256	128	288	192
Scanplane aperture	38 mm	34 mm	50 mm	23 mm	38.9 mm	38.4 mm
Field of view						38.4 mm (non-wide scan)
WideSCAN available	•	•	•	•	•	
Volume field of view						38 mm x 30°
Broadband frequency range	12-3 MHz	12-4 MHz	12-5 MHz	15-7 MHz	18-5 MHz	13-5 MHz
PureWave technology						

Application	Exam type						
Abdominal	General						
	Renal						
	Bowel	•	•	•			
	Vascular						
	Penetration						
	Resolution						
	Intervention						
Obstetrics	Early OB						
	General OB	•	•	•			
	NT						
	Penetration						
Fetal	Early fetal heart						
	Fetal heart						
Gynecology	Pelvis						
	Fertility						
	Penetration						
Cardiology	Adult						
	Pediatric				•		
	Epicardial				•		
	Epiaortic						
Vascular	Carotid	•	•	•	•	•	•
	Arterial	•	•	•	•	•	
	Venous	•	•	•	•	•	
	TCD						
	Intraoperative				•		
	Intervention	•	•				
	Superficial	•	•	•	•		
Pediatric	Abdomen	•	•	•	•	•	
	Hip	•	•	•		•	
	Neonatal cephalic	•	•				
Small parts	Superficial	•	•	•	•	•	
	General	•	•				•
	Thyroid			•		•	•
	Testicle			•		•	
	Breast	•	•	•		•	•
Musculoskeletal	Superficial			•	•	•	
	General	•	•	•		•	
Urology	Prostate						
	Bladder						
	Renal						
Biopsy guide		•	•	•		•	•



Transducer – Non-imaging		D2cwc	D5cwc	D2TCD
Type of array				
Number of elements				
Scanplane aperture				
Field of view				
WideSCAN available				
Volume field of view				
Broadband frequency range				
PureWave technology				
Application	**Exam type**			
Abdominal	General			
	Renal			
	Bowel			
	Vascular			
	Penetration			
	Resolution			
	Intervention			
Obstetrics	Early OB			
	General OB			
	NT			
	Penetration			
Fetal	Early fetal heart			
	Fetal heart			
Gynecology	Pelvis			
	Fertility			
	Penetration			
Cardiology	Adult	•		
	Pediatric			
	Epicardial			
	Epiaortic			
Vascular	Carotid		•	
	Arterial		•	
	Venous		•	
	TCD			•
	Intraoperative			
	Intervention			
	Superficial			
Pediatric	Abdomen			
	Hip			
	Neonatal cephalic			
Small parts	Superficial			
	General			
	Thyroid			
	Testicle			
	Breast			
Musculoskeletal	Superficial			
	General			
Urology	Prostate			
	Bladder			
	Renal			
Biopsy guide				

6. PercuNav image fusion and interventional navigation

6.1 Overview

The PercuNav image fusion and interventional navigation system provides the operator with the following capabilities:

Ultrasound only

- Utilize electromagnetic tracking to track a specific target area during live ultrasound-guided interventions
- Fuse an ultrasound sweep (US or contrast-enhanced ultrasound [CEUS]) with live ultrasound to enhance visualization before, during, and after ablation procedures
- Navigation via adaptive needle tracker (ANT): plan entry point and trajectory, and track a needle/device during live approach towards multiple targets

Image Fusion and Navigation

- Track a variety of ultrasound transducers to fuse ultrasound (US) with CT, MRI, or PET to find Regions of Interest that are easier to see when combining imaging modalities
- Fuse up to three advanced modality images (CT, MRI, or PET) to one another to find Regions of Interest that are easier to see when combining imaging modalities
- Fuse previously acquired (historic) advanced images (CT, MRI, or PET/CT) with live ultrasound
- Support for advanced modality images in axial, coronal and sagittal orientations
- Perform fusion and navigation procedures using integrated color Doppler controls

- Perform fast, automated fusion setup (image registration) using reusable patient trackers attached to the patient
  - PercuNav patient trackers ensure that fusion accuracy is maintained during unexpected patient motion without the need to perform fusion setup again during a procedure
  - PercuNav patient trackers are used to monitor respiratory motion to ensure consistent interventional access
- Perform fusion and navigation procedures using integrated color Doppler controls
- Perform fusion setup (image registration) using internal landmarks with fast internal plane matching or by selecting corresponding internal landmarks in each imaging modality
- Perform fusion setup (image registration) using external landmarks by manually selecting corresponding external landmarks using a PercuNav-tracked instrument
- Anatomical Intelligence Ultrasound (AIUS) Auto Registration: perform automatic fusion setup (image registration) to contrast or non-contrast liver CT or liver MRI by performing an ultrasound sweep of the liver
- Co-registration of three data sets is possible with Auto Registration in the liver
- Acquire a 3D ultrasound sweep and fuse to live 2D ultrasound for pre-/intra-/post-procedural imaging comparison (US-to-US fusion)
- Use the transducer or the control panel trackball for fast fusion adjustment in 3D and 2D, respectively
- Adjust image registration landmarks to achieve optimum fusion accuracy using the control panel trackball and set keys
- Manually adjust the fusion overlay opacity (blend) using the control panel scroll knob or have PercuNav automatically scroll through the opacity to verify fusion accuracy
- Adjust image fusion by adding an additional internal landmark point around an area of interest
- Insert annotations or measurements in the fusion mode using the touchpanel and/or keyboard/virtual keyboard
- Visualize live B-mode fundamental ultrasound, CEUS, and fusion of CT/MR/PET in quad-screen view

Interventional navigation and planning software

- Use the trackball and set key to scroll through images and annotate and update targets and points of needle entry to pre-plan procedures and guide to a pre-defined trajectory
- Navigate instruments for diagnostic and therapeutic procedures such as biopsy, ablation, drainages, and injections
- Perform out-of-plane navigation using the PercuNav Ultrasound Tracker and PercuNav navigation-tracked instrumentation
- Display a tracked instrument position graphic on CT, MRI, or PET/CT images without the use of ultrasound
- Display a tracked instrument position graphic on ultrasound with and without fusion to CT, MRI, or PET/CT.
- Display an ultrasound guidance bar representing the distance between the ultrasound scan plane and the operator-selected target
- Perform live multi-planar (coronal/sagittal/axial) reconstructions on CT, MRI, or PET/CT images
- Live reformatting of CT, MRI, or PET/CT images around the tracked needle to visualize structures
- Use color Doppler or contrast enhanced ultrasound functional imaging to identify areas of interest and guide interventions
- Monitor the status of, and configure, connected PercuNav instruments directly from the primary monitor
- Manual ablation parameter entry for treatment planning, and intra-procedural ablation monitoring and navigation
- On-screen help instructions for guidance through various fusion or navigation workflows
- Select layouts or save a customized layout with configurable views from the touchscreen

Interventional navigation tracking instrumentation

- Track instruments within a large dome-shaped tracking volume generated by the PercuNav field generator (FG)
- Connect up to six instruments to the tool connection unit (TCU) for attachment of multiple instruments including PercuNav patient trackers, PercuNav ultrasound trackers, PercuNav coaxial needle trackers, and the PercuNav adaptive needle tracker
- Carry and attach the portable TCU with its handle and flexible clip, respectively
- Easily store TCU on the back of the ultrasound system cart
- Turn any interventional device (10G-18G) into a tracked instrument by attaching the reusable PercuNav adaptive needle tracker
- Use the PercuNav adaptive needle tracker and accompanying stylus to locate and match external landmarks during fusion setup (image registration), and to plan interventional trajectories

Anatomical measurements

- 2D and 3D distance and angle measurements for measurement of skin-to-target, target size, interventional window, distance between multiple trajectories, and other distances

Connectivity

- Support for network DICOM image transfer from advanced imaging scanners or PACS on a hospital network
- Support for DICOM image import from USB or CD/DVD media
- Support for DICOM image export to external media (USB, CD/DVD) or PACS

PercuNav accessories

Product	Description	Features
PercuNav adaptive needle tracker 	Attach the PercuNav adaptive needle tracker onto a variety of interventional devices for navigation tracking, interventional planning, and fusion setup.	• Easily attach and detach from devices by tightening and loosening locking mechanism • Compatible with devices of various gauges (10G–18G) and various lengths • All components reusable in sterile field after reprocessing • 7 cm stylus included for external landmark matching and intervention planning
PercuNav ultrasound tracker C5-1 tracking bracket C9-2 tracking bracket L12-5 50 tracking bracket S5-1 tracking bracket	Ultrasound transducer tracking device is compatible with PercuNav biopsy guide brackets for: • Philips C5-1 transducer • Philips C9-2 transducer • Philips L12-5 50 transducer • Philips S5-1 transducer • Philips eL18-4 EM transducer: Integrated tracking technology is provided in this transducer, therefore no external tracking bracket is required	• Easily attach and detach a single device from any of the compatible PercuNav biopsy guide brackets • Reusable in sterile field after decontamination, under a sterile drape • Perform 3D tracked sweep and image registration • Track location of ultrasound image relative to targets and tracked interventional devices
PercuNav endocavity tracker 	Endocavity transducer tracking device is compatible with PercuNav biopsy guide brackets for Philips C10-4ec transducer.	• Reusable tracking after decontamination, under sheath • Perform image registration to advanced imaging (MRI, CT, PET/CT) • Track location of ultrasound image relative to targets and tracked interventional devices
PercuNav patient tracker 	The PercuNav patient tracker contains multiple miniature embedded sensors and CT-visible markers inside the body of the device. The device is attached to a patient with a sterile-safe adhesive on its own when used for out-of-plane ultrasound navigation, or two or more when used for automated fusion setup.	• Rapid fusion setup for CT-guided procedures • Ensures fusion accuracy during unexpected patient or field generator motion • Reusable in sterile field after decontamination, under a sterile drape

7. Measurements and analysis

7.1 Measurement tools and general description

- 2D distance
- 2D circumference/area by ellipse, continuous trace, trace by points
- Auto conversion of distance to ellipse
- 2D curved-linear distance
- 2D angle: intersection of two lines
- In 2D, three distance or distance and ellipse tools to calculate volume
- In 2D, hip angle tool and d,D ratio tool
- In 2D, percent area reduction and percent diameter reduction tools
- In 2D, Simpson tool calculate LV (left ventricle) area and volume
- In 2D, area-length tool used to calculate LA (left atrium) area and volume
- In 2D, biplane volume calculation
- In 2D, comparison tool available in contrast and elastography applications
- PISA calculation available in cardiac applications
- 3D: ellipse and distance on 2 MPR views
- 3D: stacked contours on one MPR
- M-mode distance (depth, time, slope)
- M-mode heart rate calculation
- Manual Doppler distance
- Auto conversion of distance to ellipse
- 2D trace by points
- 2D distance (micro calipers)
- 2D Simpsons
- Generic angle
- 3 distance volume
- Distance and ellipse volume
- Diameter percent reduction

- Area percent reduction
- Hip angle
- d:D ratio
- Size compare
- Doppler peak velocity
- Doppler two calipers tool
- Doppler continue trace
- Doppler trace by points
- Cardiac dP/dt
- Volume flow
- Color aliasing velocity
- Manual data entry
- RA pressure
- 3D stacked ellipses
- 3D auto stacked contours
- Manual Doppler trace
  - Cardiac trace tool generates Vmean, Vmax, MeanPG, MaxPG, VTI
  - General imaging trace tool generates PSV (peak systolic velocity), EDV (end diastolic velocity), MDV (minimum diastolic velocity), TAPV (time averaged peak velocity), TAMV (time averaged mean velocity), RI (resistive index), PI (pulsatility index), S/D (systole/diastole) ratio, and heart rate
- Time/slope measurements in Doppler and M-mode
- High Q automatic Doppler analysis (general imaging only)
  - Automatically calculates PSV, EDV, MDV, TAPV, TAMV, RI, PI, S/D ratio, and heart rate
  - Functions in live or frozen imaging
- RA (right atrium systolic) Pressure tool
- Stiffness measurement available in elastography applications

7.2 Measurement tools and quantification

QLAB quantification software

Cardiac 3D Quantification (3DQ)

- On-cart and off-cart access
- Customize capabilities via optional plug-ins
- Capable of performing 2D measurements from 3D volume and, 3D color volume multiplanar reconstruction (MPR) views
- Review and quantification of Live 3D, 3D zoom, 3D full volume, and color full volume files
- 3D image controls: 3D vision map, 3D single or dynamic colorization, 3D color render, 3D color suppress control
- Multiplanar reconstruction (MPR) views
  - 3D slice plane
  - Parallel plane
  - Unlimited MPR manipulation
  - Plane rotation, tilt, movement controls to reduce left ventricle foreshortening
- 3D annotation
- 3D spatial reference icon
- Cardiac 3D measurements, 3D quantification from MPR views includes the following measurements
  - Distance
  - Area
  - Biplane LV volume (Simpson's)
  - Biplane LV ejection fraction
  - Biplane LV mass

Cardiac 3D Quantification Advanced (3DQ Advanced)

- Left ventricle global and regional volume and timing analyses with no geometric assumption
- Comprehensive report page with AHA/ASE 17-segment bullseye plots and numeric values
- Image quality index using dedicated color scale for 3D volume quality control
- Display and manipulation of dynamic 3D rendering and left ventricular (LV) true volumes of Live 3D data sets
- Displays of 3D or dynamic 3D renderings in grayscale, single colorization, or dynamic colorization
- Multiplanar reconstruction (MPR) views
- Option to flip LV apical two-chamber display and corresponding septal, anterior, lateral, inferior (SALI) sequence
- iSlice display-compatible
- Measurements of LV endocardial true 3D volumes, LV ejection fraction, and stroke volume using semi-automated 3D border detection
- Computation of regional volumes based on AHA/ASE 17-segment LV model
- Edit mode that adds flexibility for optimal 3D border tracking in four dimensions
- Display of global LV volume waveforms, all 17 regional volume waveforms, or a subset of user-selected regional volume waveforms
- Displays of dyskinetic segments and corresponding volume waveforms in specific color and format
- Display of regional end-diastolic normalized regional volume waveforms
- User-selectable waveforms: single, by wall, by level (ring) modes
- A bullseye visualization of all 17 regional segments or the user-defined and user-selected regional segments
- Global and regional reports that provide 3D LV global values and regional timing indices from all or a subset of 17 regional segments and bullseye-based parametric imaging display
  - 3D true volume-based EDV, ESV, stroke volume, and EF
  - Standard deviation and maximal difference of time to minimum systolic volume (Tmsv) based on all or a subset of 17 regional segments
  - Tmsv values displayed in time (msec) or normalized to the R-R interval (%)
  - Bullseye showing the user-selected segments for time to minimum systolic volume (Tmsv) calculation
  - LV timing and radial excursion parametric images in bullseye format using effective color-coded scales

  - Parametric imaging supporting AHA/ASE 17-segment overlay on the bullseye for direct and rapid visualization
  - Parametric imaging that provides a radial excursion threshold slider for selective visualization of LV segments in the timing parametric display
  - Measurement data exported in Excel or DICOM SR formats

General Imaging 3D Quantification (GI 3DQ) plug-in

- 3D/4D viewer for Ob/Gyn and general imaging including interventional applications
- Review of 3D/4D, color 3D, and STIC files
- Multiplanar reconstruction (MPR)
- iSlice and curved iSlice precision volume slicing capability
  - Display of 2D/color slices from static or live volume
  - User-selectable slice display: 4, 9, 16 or 25
  - User-selectable interval spacing
  - User-selectable slicing depth
  - User-selectable slicing source (x, y or z)
- Free rotation of any source
- Full cineloop review control
- 2D grayscale display adjustments
- Color display adjustments
- Zoom control
- Cine/pan slice control through volume
- User-selectable image storage
- Quick launch to measurements
  - Auto ruler display
- Compatible with freehand and automated volumes
- 2D and 3D measurement tool including distance, area, angle, auto volume, stacked and auto contour, and ellipsoid measurements
  - Invert mode
  - Vascularization index, flow index and vascularization flow index results on 3D color mode data sets
  - Pixel intensity index
- Contrast timer marker on Affiniti 70 data sets saved with contrast timer
- Orientation labels display on Affiniti 70 data sets saved with orientation label marker
- XRES speckle noise reduction of MPR and volume displays
- Assisted auto-trace volume measurement tools for stacked contours and ellipse methods
- Edge detection selection for hypoechoic or high contrast targets
- Auto volume tool

Mitral Valve Navigator$^{A.I.}$ (MVN$^{A.I.}$)

- 3D assessment of mitral valve anatomy and associated structures
- Review and quantification of Live 3D and full volume data sets from X7-2t and xMATRIX transducer (Live 3D TEE)
- Task-driven workflow provides user direction and guidance illustrations
- Automated ES selection
- Automated 3D annulus segmentation and leaflet surface
- Associated 2D, 3D, and projected measurements and calculations sorted by group
  - Annulus
  - Leaflet
  - Aortic-Mitral
  - Coaptation
  - Papillary
- 3D image controls
  - 3D vision map
  - 3D single or dynamic colorization
  - Auto-view
  - Absolute and relative rotation
  - Three 3D render modes: volume, slices, model
- Multiplanar reconstruction (MPR) views
  - 3D slice plane
  - Unlimited MPR manipulation
  - Slice thickness
  - MPR smooth
- 3D mitral labels
- 3D mitral model
  - Model displays: tenting surface, leaflet surface, minimum surface
  - Enhanced coaptation line tracing
  - Leaflet discontinuity traces
  - Leaflet segmentation
  - Up to 53 measurements overlay
  - Exposed and coapted leaflet length and surfaces
  - Continuous display during loop playback
- Mitral valve 3D measurements and 2D/3D quantification from model view include the following measurements
  - Distances
  - Curve distances
  - Areas
  - Projected areas
  - Volumes
  - Angles
  - Ratio
- Measurement and calculation definition and overlay on 3D model
- Comprehensive reporting
- Data exported in Excel or DICOM SR formats
- Measurement data exported in Excel or DICOM SR formats

Intima Media Thickness (IMT) Quantification plug-in

- Automated assessment of the IMT on user-selected frames
- For carotid and other superficial arteries

MicroVascular Imaging (MVI) plug-in

- Integration and processing of images in contrast specific imaging mode providing detection and display of very low velocity flows of very low signal amplitude
- Motion compensation for multiframe objects

Region of Interest (ROI) Quantification plug-in

- Pixel intensity index – pixel intensity analysis, data types: echo, velocity
- Pixel intensity analysis, data types: echo, velocity (color) or power (angio)
- Up to 10 user-defined regions
- Thumbnail display of frames for easy trimming
- TDI velocity timing measurement
- Log/linear data display selection
- Smoothed data display option with various curve fitting techniques
- Vascularization index, flow index, and vascularization flow index results on color mode files
- Motion compensation for multiframe objects

Vascular Plaque Quantification (VPQ) plug-in

- 3D technology to visualize and quantify vascular plaque
- Streamlined workflow through protocol-based task guidance
  - Protocol can be turned off and on dependent upon user experience
- Automatically calculates and displays vessel and plaque boundaries for each frame
  - Outer Wall and Inner Wall ROIs automatically generated for all frames between begin and end frames
  - Plaque boundary automatically generated
  - Boundaries can be adjusted manually by user
- Analysis data presented on image
  - Total plaque volume calculated (mm^3)
  - Maximum percent area reduction calculated per-frame values: plaque/lumen/wall areas, and plaque echo intensity
- Tool tips for analysis data explanation
- Analysis data shown on the graph
  - Lumen area
  - Plaque area
  - Percent reduction over vessel length
- Data exported in Excel or DICOM SR formats
- Supports monochrome, single-volume 3D volumes acquired with the VL13-5 transducer
- Measurement data exported in Excel or DICOM SR formats

Strain Quantification (SQ) plug-in

- Tissue Doppler Imaging (TDI) velocity quantification
  - Used in the evaluation of regional myocardial function
- Measures the myocardial velocity from color TDI data set and derives the displacement, strain, and strain rate along user-defined M-lines
- Cardiac phases display (overlay of AVO, AVC, MVO, and MVC mechanical events auto-imported from ultrasound cart analysis via DICOM SR or manual entry) on SQ curves for left ventricle mechanical events
- User-selectable waveform display that makes SQ curves easy to read
  - User-defined M-line motion to follow the myocardial motion
- Point of Interest (POI) tool that obtains values from any point on the M-mode display
- M-mode (hide or display) control
- User-defined and automatic (using speckle tracking algorithms) M-line motion compensation to follow 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
- Curve processing modes
- TDI velocity, displacement, strain, and strain rate timing measurements with dedicated time calipers and labels
  - 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

Automated Cardiac 2D Quantification[A.I.] (a2DQ[A.I.]) and a2DQ[A.I.] LA

- Left ventricle and left atria global volume analysis from 2D and biplane images
- Quantification of native and non-native images
- Quantification of non-ECG images
- Automated border detection for cardiac chambers and vessel cavities
- Computation of area, LV volumes, and advanced parameters for LV systolic and diastolic function including fractional area change (FAC), ejection fraction (EF), peak ejection rate (PER), peak rapid filling rate (PRFR), and atrial filling fraction (AFF)
- Computation of LA area, volumes, and advanced parameters including fractional area change (FAC) and ejection fraction (EF)
- Single-plane volume measurements based on Simpson's Single Plane Method of Disks (MOD)
- Biplane volume measurements based on Simpson's Biplane Method of Disks (MOD)
- Automated Tissue Motion Annular Displacement (aTMAD)
  - Mitral valve and other valve annular motion tracking over time
  - Computation of valve annular displacement curves over time
  - Color Kinesis overlay to visualize valve annular plane motion parametrically
  - Measurement data exported in Excel or DICOM SR formats
  - Simplified workflow with SmartExam

Automated Cardiac Motion 2D Quantification[A.I.] (aCMQ[A.I.])

- Automated Region of Interest for selected anatomical views
- Objective assessment of left ventricle global function and regional wall motion, deformation, and timing using the next generation of 2D speckle tracking technology
- File compatibility
  - Quantification of 2D native and non-native ultrasound DICOM images
  - Quantification of non-ECG images
- Available methods with dedicated preferences settings
  - Global workflow
- Latest generation of 2D speckle tracking technology
- Auto ROI can be set either on ED or ES frame
- Automated border detection for cardiac chambers and vessel cavities
- Auto aortic valve closure time detection
- Smooth color transited bullseye presentation
  - Multiple cardiac view/images capable
  - 18 or 17 left ventricle segmentation templates (three apical views and three short-axis view templates)
  - Easy-to-edit template position and shape
  - Intuitive step-by-step user interface
  - Tracking quality control by right clicking the segment to remove the poorly tracked segment
  - User-editable post LV segments display consistent display with corresponding waveform and reported values beat-to-beat selection
- Display
  - Border (hide or show)
  - Image ROI Overlay (hide or show)
  - Cardiac phases (overlay of AVO, AVC, MVO, and MVC mechanical events auto-imported from ultrasound cart analysis via DICOM SR or manual entry)
  - Four up display
- 2D speckle parameters
  - Volume/EF and area/FAC
  - Longitudinal strain and strain rate
  - Circumferential strain and strain rate
  - Radial and transversal displacement
  - Radial fractional shortening
  - Radial velocity
  - Speed (absolute angle independent velocity)
  - Regional rotation and rotation velocity
  - Global rotation (SAX)
  - Endo-Epi mural torsion and local rotation
- Measurement and calculations
  - Selectable GLS measurement points: peak, peak systolic and end systolic
  - Time-to-peak and peak values
  - Timing caliper
  - Global result display one view and global result display
  - Results display in 18 or 17 LV segment bullseye plot format and numerical table
  - Layer specific (Endo, Mid and Epi) longitudinal strain per view and global longitudinal strain
  - Circumferential strain per view and global circumferential strain
  - User-defined workflow for specific local strain analysis
- Up to 18 dedicated colors to help differentiate each cord and corresponding waveform
- Up to three waveform auto peak detections to report time-to-peak and peak values
- Simplified workflow with SmartExam
- Measurement data exported in Excel or DICOM SR formats

Elastography Analysis (EA)

Provides strain elastography analysis of relative tissue deformation based on an elastogram.

- Thumbnail display of frames
- Compatible with Affiniti systems using Elastography mode with L12-5, C10-3V, and C9-4v transducers

Fetal Heart Navigator

- Protocol-driven workflow
  - Automates the initial ductal arch view
  - Guides user in obtaining view recommended in ISUOG Fetal Cardiac Screening Guidelines
  - Obtains the fetal heart views: 4-chamber, LVOT, and RVOT
- Supports V6-2 STIC data sets containing eight or more frames
- Presets supported: OB difficult, OB early, OB fetal echo, OB fetal echo CV, OB general, OB max pen
- Visualization controls allow users to change display settings at any stage in the protocol
  - Chroma Map
  - Gray Map
  - Slice thickness
  - Brightness

Elastography Quantification (EQ)

- Available in both single screen and side-by-side display modes
- Ability to generate up to 10 user-defined regions of interest (ROIs)
- Thumbnail display of frames
- Measurement results
- Strain rate
- Total strain
- Size comparison between two ROIs
- Strain ratio
- Calculation of maximum strain ratio
- Calculation of average strain ratio
- Calculation of ratio between two user-defined ROIs
- Graphical display
- Strain ratio parametric image
- Color-coded display of strain ratios with parametric imaging

7.3 High Q automatic Doppler analysis

- Automatic real-time and retrospective tracing of:
  - Immediate peak velocity
  - Immediate intensity-weighted mean velocity
- Automatic real-time display of (user-selectable up to six):
  - Volume flow
  - Time-averaged peak velocity
  - Time-averaged mean velocity
  - Resistive index
  - Pulsatility index
  - Systolic/diastolic ratio
  - Acceleration/deceleration times
  - Illustrated High Q

7.4 Clinical option analysis packages

- Cardiac analysis
  - Left atrium
  - Right atrium
  - Right ventricle
  - Left ventricle
  - TAVI (transcatheter aortic valve implantation)
  - Valve stenosis
  - Prosthetic aortic valve
  - Prosthetic mitral valve
  - TAPSE (tricuspid annular plane systolic excursion)
  - MAPSE (mitral annular plane systolic excursion)
  - PCWP (pulmonary capillary wedge pressure or pulmonary artery occlusion pressure)
  - Stress echo measurements in various stages
  - MPI (or TEI index)
  - Volume by area/length method

  - M-mode ejection fraction (via Teichholz or cubed method)
  - Novel 3-point adjustable Simpson's template
  - Simpson's biplane and single plane volume and ejection fraction
  - Area, length, volume, and ejection fraction
  - LV mass
  - 2D all points
  - M-mode all points
  - Peak velocity
  - Maximum and mean pressure gradients
  - Pressure half time
  - E/A ratio
  - D/E slope
  - Continuity equation
  - Diastolic function
  - Cardiac output
  - Acceleration time
  - Heart rate
- Vascular analysis
  - Right and left carotid artery protocols
  - ICA/CCA ratio
  - Bilateral lower extremity arterial and venous labels
  - Bilateral upper extremity arterial and venous labels
  - Percent diameter and area reduction
  - Vascular graft measurement package
  - User comments
  - High Q automatic Doppler analysis
- OB analysis
  - Fetal echo application
  - Fetal biometry (up to quintuplets)
  - Biophysical profile
  - Amniotic fluid index
  - Early gestation
  - Fetal long bones
  - Fetal cranium
  - Other OB measurements
    - 2D echo
    - Fetal heart M-mode
    - Fetal Doppler
    - Fetal echo
- aBiometry Assist[A.I.]
- Gynecology/fertility
  - Uterine volume
  - Right and left ovary volumes
  - Right and left follicles (10)
  - Endometrial thickness
  - Cervical length
- Abdominal vascular
  - Labels for all major abdominal arteries and veins
  - Left and right segmentation for kidneys
- General imaging
  - General
  - User-defined labels
- Prostate
  - Prostate gland
- Pediatric
  - General
  - d:D radio
- Small parts
  - General
  - Breast with right and left protocols for up to five lesions per breast
  - Testicle
    - Testicle volume
    - EPI head, body, tail
- Urology
  - Prostate, PSA, PSA density

8. Physical specifications

System dimensions

Width	57.2 cm/22.5 in
Height	142.2-162.6 cm/56-64 in
Depth	98.3 cm/38.7 in
Weight	83.6 kg/184.4 lb without peripheral devices

System cart

- State-of-the-art ergonomic design for comfort and convenience
- Easy maneuverability and mobility
  - Wheel-lock and monitor adjustments that facilitate bedside exams
- Independent height adjustment of control panel and display monitor
- Easily accessed transducer connector ports, USB, and DVD media drive
- Transducer and gel bottle holders
- Unique easy clip cable management solution that keeps cables tangle-free and reduces damage while decreasing cable strain to enhance comfort while scanning

- Mobility through high quality, shock-absorbing casters with foot pedal controls for:
  - 4-wheel swivel
  - 2-wheel swivel lock
  - 2-wheel brakes
- Integrated footrests
- Digitally enhanced two-speaker high fidelity stereo output with rear-mounted subwoofer
- On-board storage tray behind control panel touch screen and in rear bay storage drawer
- On-board printer bay that provides easy and ergonomic access to your printing device
- Universal peripheral bay that provides easy access for on-board hardcopy or documentation devices
- Built-in A/C line conditioner that provides isolation from voltage fluctuations and electrical noise interference
- Two high-capacity fans with decreased audible noise

Monitor

- Flat panel LCD display monitor
  - 54.6 cm (21.5 in) wide format high definition flat panel TFT/IPS display
  - High contrast ratio >1000:1
  - Extended viewing angle >178° (horizontal and vertical)
  - Response time: <14 ms
  - Virtually flicker-free technology
  - Mounted on fully articulating extension arm
  - Four-way articulation with 87.6 cm/34.5 in lateral and 17.8 cm/7 in vertical adjustment range
    - Nearly infinite positioning adjustments: height, swivel, and tilt

Control panel

- Articulation facilitates nearly infinite positioning adjustments for optimum scanning ergonomics: height, swivel, and tilt
  - Up and down 20.3 cm/8 in
  - Rotates 180° from center
  - Palm rest

Physio

- One 3-lead ECG input
  - Gain, sweep rate, and display position controls
  - Automatic heart rate calculation and display
  - Fault condition display
  - Cineloop locator displayed on one ECG input from an ECG source like stress ECG or ECG monitor

Peripherals

- The system supports up to two on-board peripheral devices (excluding report printers)
  - Video-recording peripherals, operated via system user interface
  - DVD recorder (cart-dependent)
  - Small format digital B/W printer (USB)
- AI Breast
- Support for large format external B/W or color printer
- Support for various Hewlett-Packard, Epson, and Xerox brand color and monochrome report printers (USB, externally mounted)

Input/output ports

- Export of measurement and analysis data to off-line reporting software packages (USB) and RS-232
- Display port video export available for either full screen resolution of 1920x1080 (1080p), display area 1024x768 VGA, or S-Video in NTSC or PAL format

Power requirements and video parameters

- 100V-240 V, 50 Hz/60 Hz – PAL/NTSC
- Integrated A/C line conditioning and battery back-up system
- Power consumption: up to 450 watts

Electrical safety standards

- Electromechanical Safety Standards met
  - CAN/CSA 22.2 No. 60601-1, Medical Electrical Equipment: General requirements for basic safety and essential performance
  - IEC 60601-1, Medical Electrical Equipment: General requirements for basic safety and essential performance
  - IEC 60601-1-2, Collateral Standard, Electromagnetic compatibility – requirements and tests
  - IEC 60601-2-37, Particular Requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment
  - ANSI/AAMI ES60601-1, Medical Electrical Equipment: General requirements for basic safety and essential performance
- Electromechanical Safety Standards met (EU Only)
  - EN60601-2-37, Particular requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment
- Agency approvals
  - Canadian Standards Association (CSA)
  - CE Mark in accordance with the European Medical Device Directive issued by British Standards Institute (BSI)

9. Maintenance and services

Maintenance

- Easy customer access to air filter for cleaning
- System designed for easy replacement of key components by your facility's biomedical engineers
- First responder access to diagnostics and utilities
- Flexible RightFit service agreements
  - Maximize uptime
  - Access Philips award-winning service organization
  - Minimize risk

Services*

Philips Remote Services Connectivity is designed with security in mind and allows for many advanced service features.

Security

Philips Remote services are based on a comprehensive security infrastructure including iSSL technology, encryption, and protocols to protect patient information

Advanced service features

- Virtual on-site visits for both clinical and technical support, providing fast resolution to issues and questions
- Remote clinical education
- Remote log file transfer decreases downtime by allowing rapid diagnosis of problems by call center personnel
- Online Support Request
  - Simplifies support engagement
  - Provides fast response to clinical questions and technical issues
  - Allows request to be entered by user directly on ultrasound system
- Proactive monitoring
  - Helps prevent unscheduled downtime
  - Monitors key system parameters
  - Sends an alert to Philips Call Center so action can be taken before system operation is affected
- Remote Software Distribution boosts performance over the entire system lifecycle
- Clinical applications support available
- On-cart transducer test provides confidence in your transducer quality
- Optional Utilization Report provides data to help manage ultrasound assets
  - Track system and transducer usage
  - Summarize data about exam types and duration
  - Provide data to help with credentialing and privileging
  - Identify referrals by exam type
- Flexible Clinical Education offerings include:
  - Webinars
  - Symposiums
  - On-site
  - Classroom
  - Remote

* Optional. Not all services available in all geographies; contact your Philips representative for more information. May require service contract.

© 2017 Koninklijke Philips N.V. All rights are reserved.
Philips reserves the right to make changes in specifications and/or to discontinue any product at any time without notice or obligation and will not be liable for any consequences resulting from the use of this publication. Trademarks are the property of Koninklijke Philips N.V. or their respective owners

www.philips.com/affiniti

Printed in The Netherlands.
4522 991 29781 * OCT 2017