

Ultrasound system

A . Features

The Ultrasound system is an ultra-premium cardiovascular ultrasound system that enhances visualization with remarkable new precision and clarity, powered by our most advanced and adaptive platform yet. One-click optimization, AI and automation can reduce tedious tasks and inter-operator variability, enabling faster and more accurate diagnostics and interventions.

The next generation cSound™ imaging platform, cSound, and XDclear™ probe technology deliver deep penetration and high sensitivity while maintaining high spatial resolution.

The system is designed to excel in adult 2D and 4D cardiac imaging, as well as in the following clinical application areas: pediatric cardiac, fetal/obstetrics, abdominal (including renal, GYN/pelvic), pediatrics, small organ (including breasts, testes and thyroid), adult and neonatal cephalic, peripheral vascular, musculoskeletal conventional, musculoskeletal superficial, urology/prostate, transesophageal, transrectal, transvaginal and intraoperative vascular.

B . Constitutions

1.	. Basic system architecture	1 set
2.	. True Confocal Imaging (TCI)	1 set
3.	. Adaptive Contrast Enhancement (ACE)	1 set
4.	. cSound	1 set
5.	. Auto Optimization (ATO, ASO)	1 set
6.	. Clarity+	1 set
7.	. Anatomical M-mode (AMM)	1 set
8.	. Curved Anatomical M-mode (Camm)	1 set
9.	. HD imaging	1 set
10.	. Virtual Apex	1 set
11.	. LVO contrast	1 set
12.	. Tissue Velocity Imaging (TVI)	1 set
13.	. Tissue Tracking (TT)	1 set
14.	. Advanced Qscan	1 set
15.	. Q-Analysis	1 set
16.	. Z-Score	1 set
17.	. Spline Trace	1 set
18.	. Multiple-angle compound imaging	1 set
19.	. Ultrasound View - Extended Field of View	1 set
20.	. Virtual Convex imaging	1 set
21.	. Blood Flow Imaging	1 set
22.	. IMT	1 set
23.	. Strain Elastography	1 set
24.	. Scan Assist Pro	1 set
25.	. Pre-Post Compare	1 set
26.	. Privacy Security and data protection	1 set
27.	. QuickApps	1 set
28.	. FlexiViews	1 set
29.	. Advanced 4D User Package (Dynamic multi-slice views)	1 set
30.	. 2-Click Crop	1 set
31.	. Dual Crop	1 set
32.	. Quick Rotate	1 set
33.	. Biplane / Triplane imaging	1 set
34.	. 4D Views/4D Stress Echo	1 set
35.	. HDlive	1 set
36.	. HD Color	1 set
37.	. Radiant Flow	1 set
38.	. Blood Speckle Imaging 2.0 (BSI 2.0)	1 set
39.	. AI Auto Measure 2D	1 set
40.	. [Package] Measurement Productivity	1 set
	(1) AI Cardiac Auto Doppler	
	(2) Easy AutoEF	
	(3) Easy AFI	
41.	. [Package] Advanced Strain	1 set
	(1) AFI RV	
	(2) AFI LA	
42.	. Myocardial Work	1 set
43.	. [Package] Chamber Quantification	1 set
	(1) 4D Auto LHQ (LV and LA quantification)	
	(2) 4D Auto RVQ	
44.	. 4D Auto LAQ	1 set
45.	. [Package] Valve Quantification	1 set
	(1) 4D Auto AVQ	
	(2) 4D Auto MVQ	
	(3) 4D Auto TVQ	
46.	. 4D LV Strain	1 set
47.	. [Package] 4D Vision	1 set
	(1) Silhouette	
	(2) FlexiLight	
48.	. [Package] Structural Heart	1 set
	(1) 2-Click Align	
	(2) AI FlexiView LAA	
	(3) TSP tool	
	(4) LAA Sizing tool	
	(5) LAA Compression tools	
	(6) 4D Markers	
	(7) Remote Viewing	
49.	. Adv. Contrast Imaging	1 set
50.	. Stress	1 set
51.	. AFI Stress	1 set
52.	. M5Sc-D Active Matrix Single Crystal Phased Array Probe	1 set
53.	. 4Vc-D Active Matrix 4D + 2D Volume Phased Array Probe (One probe solution)	1 set

54.	. 11L-D Linear Array Probe	1 set
55.	. 9VT-D TEE probe	1 set
56.	. ECG Cable set	1 set
57.	. Back Storage	1 set
58.	. DVD	1 set
59.	. B/W Printer	1 set
60.	. O/S Manual (Soft Copy)	1 set
61.	ECHOPACK PC S/W UPGRADE	1 set
62.	10TB NAS	1 set

C . Specifications

1 . Basic system architecture

- 1) exclusive, programmable and flexible digital software beamforming technology, cSound
- 2) cSound increased dynamic range, up to 2X data throughput from analog frontend to digital beamformer, 70% more image processing power, and faster AI performance claims, compared
- 3) 23.8" high-resolution, high-contrast, wide-screen HDU (LED) monitor (Resolution: 1920 x 1080 px)
- 4) 15.6" ultra-high-resolution, wide-screen format, color, multi-touch LCD screen
- 5) Five active probe ports
- 6) Integrated 1 TB SSD hard drive
- 7) Multiple USB ports (front/back)

2 . True Confocal Imaging (TCI)

- 1) Ultra narrow focused two-way beam profile throughout the field-of-view, maintaining frame rate, no zone stitching, no multi-line acquisition artifacts and enhanced dynamic contrast resolution throughout field-of-view compared to conventional focal imaging

3 . Adaptive Contrast Enhancement (ACE)

- 1) Emphasizing echoes from real structures while reducing noise/haze, resulting in enhanced signal-to-noise ratio

4 . cSound

- 1) Correcting for ultrasound wave distortions caused by in-homogeneities of the speed of sound naturally present in the body, resulting in sharper and higher contrast images

5 . Auto Optimization(ATO, ASO)

- 1) Automatic tissue optimization (ATO) : Single keystroke optimizes immediately automatically and dynamically different grayscale settings with the goal of signal independent uniform gain and contrast distribution
- 2) Automatic Spectrum Optimization (ASO) : It provides a single push, automatic, real-time optimization display of PW or CW spectrum scale and baseline

6 . Clarity+

- 1) Spatial filtering to suppress noise and graininess (speckles), typical for ultrasound imaging, while sharpening boundaries and tiny structures and thereby giving a more pleasing presentation of the tissue structures while maintaining true tissue architecture

- 7 . **Anatomical M-mode (AMM)**
 - 1) M-mode cursor can be adjusted at any plane
 - 2) Free (curved) drawing of M-mode generated from the cursor independent from the axial plane
 - 3) Anatomical M-mode and Curved Anatomical M-mode displays Strain Mode
- 8 . **Curved Anatomical M-mode (Camm)**
 - 1) Free (curved) drawing of M-mode generated from the cursor independent from the axial plane
 - 2) It displays allowing an M-mode along an arbitrary curve in a 2D image
 - 3) Anatomical M-mode and Curved Anatomical M-mode displays SI and SRI
- 9 . **HD imaging**
 - 1) Real-time simultaneous acquisition at dual frequencies compounded to help reduce speckle and noise while enhancing resolution and contrast
- 10 . **Virtual Apex**
 - 1) Virtual apex provides a wider field of view with phased array probes, effective at certain imaging views where a wide near field is preferred
- 11 . **LVO contrast**
 - 1) Enables contrast applications intended for imaging of the left ventricle
 - 2) LV contrast enhances delineation of the LV border in combination with ultrasound contrast agents
- 12 . **Tissue Velocity Imaging (TVI)**
 - 1) Myocardial Doppler imaging with color overlay on tissue image
 - 2) Tissue Doppler data can be acquired in background during regular 2D imaging
 - 3) The velocity of myocardial segments after entire heart cycle can be displayed in one single image
- 13 . **Tissue Tracking (TT)**
 - 1) Real-time display of the time integral of TVI for quantitative display of myocardial systolic displacement
 - 2) Myocardial displacement is calculated and displayed as a color-coded overlay on the grayscale and M-mode image – different colors represent different displacement ranges
- 14 . **Advanced Qscan**
 - 1) Package of Doppler based Left Ventricular quantification tools. Includes TSI (Tissue Synchronization Imaging), Advanced TSI, Strain and Strain Rate
- 15 . **Q-Analysis**
 - 1) Traces for velocity or derived parameters inside defined regions of interest as function of time
 - 2) Contrast analysis with traces
- 16 . **Z-Score**
 - 1) Support for five sets of user-selectable Z score publications covering the most common pediatric dimension measurements
- 17 . **Spline Trace**
 - 1) A generic spline (polynomial interpolation) tracing tool for cardiac structures.
The tool's tracing is based on user-defined points in the image, added by trackball/trackpad clicks.
- 18 . **Multiple-angle compound imaging**
 - 1) Multiple coplanar images from different angles combined into a single image in real-time to help enhance border definition and contrast resolution, as well as reduce angular dependence of border or edge as compared to no-compound imaging
- 19 . **Ultrasound View - Extended Field of View**
 - 1) Provides the ability to construct and view a static 2D image with wider field-of-view of a given transducer. This allows viewing and measurements of anatomy that is larger than what would fit in a single image
- 20 . **Virtual Convex**
 - 1) Virtual convex allows a wider FOV and aims to enhance image quality on linear probes in particular
- 21 . **Blood Flow Imaging**
 - 1) Combines color Doppler with grayscale speckle imaging
 - 2) Helps improve delineation of blood flow without bleeding into tissue or vessel wall
- 22 . **IMT**
 - 1) Automatic measurements of carotid artery Intima Media Thickness (IMT) on any acquired frame
- 23 . **Strain Elastography**
 - 1) Visualization of relative tissue stiffness
- 24 . **Scan Assist Pro**
 - 1) Customizable automations that assist the user through each step of the scan
 - 2) Helps enhance consistency and reduce keystrokes

- 25 . **Pre-Post Compare**
 - 1) Labelling of measurements and images acquired in different stages of an exam or procedure, allowing to compare measurements pre and post procedure.
- 26 . **Privacy Security and data protection**
 - 1) Windows 10 with whitelisting, disk Encryption and LDAP
- 27 . **QuickApps**
 - 1) Factory and user programmable sub-preset feature that keeps 2D and geometry settings while adapting color flow or contrast parameters
- 28 . **FlexiViews**
 - 1) Provides instant access to predefined (factory or user created) 4D views during live mode
 - 2) May provide more consistent data while reducing scanning time
- 29 . **Advanced 4D User Package (Dynamic multi-slice views)**
 - 1) Auto Align / Measure on Render / Multi-Slice /Live Multi-slice
- 30 . **2-Click Crop**
 - 1) It is for quick and easy extraction of standard and non- standard views for visualization of 4D structures seen during or after the examination
- 31 . **Dual Crop**
 - 1) It is for fast and efficient visualization of complex structures from both sides at the same time
- 32 . **Quick Rotate**
 - 1) QuickRotate and Rotate are for a flexible and easily accessible way of obtaining the desired single- or multi-plane, two dimensional views
- 33 . **Biplane / Triplane imaging**
 - 1) Bi-plane and/or tri-plane acquisition
- 34 . **4D Views/4D Stress Echo**
 - 1) Auto alignment to define standard orientation of acquired 4D data
 - 2) Standard views, such as 4CH, 2CH, LAX, mitral valve and aortic valve, are defined from the standard orientation
 - 3) Automatic display of volume renderings and 2D cut planes from standard views
 - 4) Simultaneous display of three apical and one short-axis projection during acquisition, 4D Volume images analyzed in long-axis or short-axis projections.
 - 5) Long-axis analysis allow rotating the plane around the main axis, Short-axis analysis allow translation of the plane along the main axis
- 35 . **HDlive**
 - 1) Acquisition and visualization providing enhanced display of anatomical structures using advanced shadowing techniques in combination with depth illuminating colors
- 36 . **HD Color**
 - 1) Enhances the perception of 4D color when visualized on a 2D monitor by addition of shadowing and specular reflection techniques
 - 2) Offers the ability to see turbulent velocity components inside the flow volume
- 37 . **Radiant Flow**
 - 1) 3D-like appearance of 2D Color Flow images, by applying shading based on the power of the color flow signal to the regular 2D Color Flow images
- 38 . **Blood Speckle Imaging 2.0 (BSI 2.0)**
 - 1) Offers a new way of visualizing blood flow, combining color Doppler with grayscale speckle imaging
 - 2) Visualizes blood flow patterns by a graphical representation of the trajectories of the blood cells
 - 3) Simple quantification tools available – Distance, Area, Time
- 39 . **AI Auto Measure 2D**
 - 1) The AI based Auto Measure 2D feature enables automated quantification of the most common distance measurements performed on parasternal LAX 2D images
 - 2) Minimal user guidance is required, but manual editing capabilities are supported
- 40 . **[Package] Measurement Productivity**
 - (1) AI Cardiac Auto Doppler
 - 1) AI-based tool providing the most common Spectral Doppler measurements used in standard echo exams.
 - 2) Additionally, for the adult TTE probes, an AI-based Spectrum Recognition algorithm automatically selects the correct measurement tool and hence reduces the number of steps to initiate the tool.
 - (2) Easy AutoEF
 - 1) AI-based tool for measuring left ventricular ejection fraction (bi-plane Simpsons) on loops acquired with or without ECG and with no manual interaction apart from initiating the tool and approving the results
 - (3) Easy AFI
 - 1) AI- and speckle-tracking based tool for measuring left ventricular global and segmental strain (and ejection fraction) requiring no manual interaction apart from initiating the tool and approving the results.

41 . [Package] Advanced Strain

(1) AFI RV

- 1) An automated parametric tool giving quantitative data for right ventricular longitudinal Global Strain, Free Wall Strain and Segmental Strain derived from raw data images of the apical 4-chamber RV focused view

(2) AFI LA

- 1) Parametric tool giving quantitative data raw data images for left atrial longitudinal global strain as well as LA volumes and Emptying Fraction derived from the apical 4-chamber and 2-chamber views

42 . Myocardial Work

- 1) After adding the external blood cuff pressure and event timing for each AV/MV valve opening/closure a strain pressure curve, a work index and a work efficiency percentage is produced important especially for follow-up of patients over time.

43 . [Package] Chamber Quantification

(1) 4D Auto LHQ (LV and LA quantification)

- 1) Semi-automated simultaneous quantification of left ventricle and left atrium volumes and ejection fractions.
- 2) Including optional LV mass and sphericity index measurements.

(2) 4D Auto RVQ

- 1) Semi-automated quantification tool for measuring right ventricular volumes, ejection fraction, diameters, TAPSE and RV FAC.

44 . 4D Auto LAQ

- 1) The Left Atrium Quantification tool uses the volume ultrasound data of the scanner.
- 2) The semi-automatic surface detecting algorithm helps clinical users get fast, reproducible and accurate 4D quantification of the left atrium, acquired with 4D TTE probes.

45 . [Package] Valve Quantification

(1) 4D Auto AVQ

- 1) Automated alignment, segmentation and measurement of aortic valve annulus dimensions from volumetric data, including area and circumference.

(2) 4D Auto MVQ

- 1) fully integrated semiautomated mitral valve quantification package offers the ability to visualize the mitral valve and include quantitative results into the patient exam

(3) 4D Auto TVQ

- 1) 4D Auto TVQ is a measurement tool for the tricuspid valve
- 2) The semi-automatic surface detecting algorithm helps clinical users to get fast, reproducible and accurate 4D visualization and quantification of the tricuspid valve

46 . 4D LV Strain

- 1) Semi-automated tool for visualization and quantification of left ventricular 4D-strain.

47 . [Package] 4D Vision

(1) Silhouette

- 1) Volume rendering of the boundaries between cavities and tissue structures (or devices) to visualize internal structures or to avoid tissue to block color flow data.

(2) FlexiLight

- 1) Provides a type of visualization intended to enhance depth perception of 3D objects on a 2D monitor by use of advanced shadowing, reflection and shading algorithms in combination with depth rendering techniques

48 . [Package] Structural Heart

- (1) 2-Click Align
 - 1) Quick and easy alignment of FlexiSlice views along 3D structures, such as catheters, regurgitant jets or valves.
- (2) AI FlexiView LAA
 - 1) AI-based identification of the LAA in 2D or biplane to zoom on to the LAA and achieve high-quality, high-resolution 4D recordings of the LAA by pushing one button only.
- (3) TSP tool
 - 1) Tool for guiding transseptal punctures (TSP) by letting the operator identify the mitral anulus and the tip of the catheter and displaying the distance between these two locations.
 - 2) This to help verify that the planned TSP location is within the guideline for the ongoing interventional procedure.
- (4) LAA Sizing tool
 - 1) Semi-automated tracing tool that snaps on, like a magnet, to the strongest cavity-to-tissue boundary, when outlined by the operator.
 - 2) For measurements of the LAA landing zone perimeter, major and minor axes.
- (5) LAA Compression tools
 - 1) Vendor specific measurement tools (ball and disk-devices) for documenting the compression tests after device deployment.
- (6) 4D Markers
 - 1) The 4D Markers option enables placements of markers/annotations into a 4D ultrasound volume data set.
 - 2) The markers stay in 4D space and as such can be seen regardless of from which direction the volume is rotated/viewed.
- (7) Remote Viewing
 - 1) Network based streaming of the screen of the console to a web-browser on a remote device (PC, MAC or pad)

49 . Adv. Contrast Imaging

- 1) Enables Contrast Low MI application preset.

50 Stress

- 1) Stress option includes support for treadmill-, bicycle- as well as pharmacological stress protocols, including a continuous capture mode for acquisition and selection of projection views

51 . AFI Stress

- 1) Dedicated protocol and workflow integrating AFI as part of a stress exam (pharmacological, as well as exercise)
- 2) Acquire standard apical 2D views and quantify wall motion at all stress levels

- 52 . **M5Sc-D Active Matrix Single Crystal Phased Array Probe**
 1) Probe presets: Cardiac, pediatric, abdominal, fetal heart, cranial, coronary, stress (exercise, Qstress and LVO stress), LV contrast, renal, contrast now MI
- 53 . **4Vc-D Active Matrix 4D + 2D Volume Phased Array Probe (One probe solution)**
 1) Probe presets: Cardiac, LV contrast, LVO stress, fetal heart, stress, coronary, transcranial, abdominal, pediatric
- 54 . **11L-D Linear Array Probe**
 1) Probe presets: Vascular (incl. carotid, LEA, LEV, UEA, UEV), breast, small parts, msk, thyroid, scrotal
- 55 . **9VT-D TEE probe**
 1) Probe presets: Cardiac including Adult and Pediatric ranging from 5kg, LVO contrast, coronary
- 56 . **ECG Cable set**
- 57 . **Back Storage**
- 58 . **DVD**
- 59 . **B/W printer**
- 60 . **O/S Manual (Soft Copy)**
- 61 . **ECHOPACK PC S/W UPGRADE**
- 62 . **10TB NAS**

D . Remarks

- 1 . **Installation**
 Contractor is responsible for installation of this equipment at customer's premise.
- 2 . **Warranty Conditions**
 Contractor or Supplier should be responsible free of charge after service(A/S) whenever there is any defect or trouble during 3 years after the equipment is officially accepted by end-user.
- 3 . **Supplier should provide software upgrade service for free through FMI.**
- 4 . **In no case shall the amount of damages to be paid by Seller to the Purchaser exceed the contract price.**