SL No.	Description of Equipment
	Color Doppler Ultrasound System **(Touch Screen)** **Make : Sonostar Model : C8**   **Imaging Modes** · B · B+B · 4B · B+M · M · B-steer · Compound + Trapezoid · Color Doppler (CFM) · Power Doppler (PDI) · Directional Power Doppler (DPDI) · Pulsed Wave Doppler (PWD) · B+PWD (Duplex) · B+CFM/PDI/DPDI+PWD (Triplex) · High Pulse Repetition Frequency (HPRF) · Tissue Harmonic Imaging (THI) **Ultrasound imaging** · ultrasound image size: automatically adjustable to screen resolution · gray scale: 256 · color scale: 256 · full motion and full size real-time ultrasound imaging, up to 120 fps (depends on selected scan depth, scan angle, focus mode, High Line Density setting, computer speed) · cineloop recording/play: several thousands frames (depends on computer memory size and scan mode)

	· zoom mode: from 60% to 600% in all modes (Scan, Freeze, B, B+B, 4B, Doppler modes, M-zoom, cineloop and etc) · viewing area variable for frame rate maximizing: 6 steps · thumbnail mode: up to 32 images · "Freeze" mode · "Auto Freeze" mode **Scanning Method** · electronic linear · electronic convex · electronic microconvex · scanning depth: 2-30 cm **Transducers** · convex, micro-convex, linear, transvaginal o from 2,0 MHz to 12,0 MHz o multifrequency · automatic transducer recognition **Color Doppler** · PRF variable: 0.5-10 kHz · wall filter settings: 3 steps (5%, %10%, 15% PRF) · gain control: 50 dB · angle steering for linear transducers: ±10° · real-time spatial filter: 4 values · CFM palette: 10 maps · PDI palette: 11 maps · B/Color priority control · color threshold control · CFM baseline control · Doppler frequency selection: 2 frequencies / each transducer · color frame averaging: 8 values · Transparent Color Mapping (TCM): 10 values **Automatic Image Optimization** · single click auto adjustment: o B-image: gain, dynamic range, TGC sliders o Color Doppler: CFM/PDI/DPDI gain o Pulsed Waved Doppler: baseline, invert, PRF **Pulsed Wave Doppler** · PRF variable: 1-15 kHz · wall filter settings: 16 steps (2.5%-20% PRF) · gain control: 50 dB · angle steering for linear transducers: ±10° · real-time trace line with automatic calculation of spectrum parameters · stereo sound: volume control · PWD palette: 12 maps · Doppler frequency selection: 2 frequencies / each transducer

Focusing

- digital transmit focusing
- multi focus mode:
  - transmit/receive focusing
  - programmable focus area presets
- dynamic focus mode:
  - transmit variable focus
  - dynamic receive focus

Processing

- High Line Density scan mode for better resolution
- TGC Control, 5-10 sliders (customizable) 40 dB
- dynamic range: 120 dB, 8 values
- overall gain control
- M - mode sweep speed control
- acoustic power control
- variable frame averaging
- brightness, contrast
- advanced gamma control: 8 fixed curves, 8 user defined (custom)
- scan direction, rotation, up-down controls
- negative / positive control
- bi-linear interpolation
- echo enhancement control
- noise rejection function
- speckle reduction and structure improvement PureView: 8 algorithms

Functions

- mouse / trackball / keyboard operation
- anatomical icons with transducer position indicator
- direct e-mail sending with image or video attachment via Internet
- DICOM file push to server
- printing on system printer
- unlimited programmable presets for clinically specific imaging
- TV output via computer display adapter

File Formats

- image and video save / load
  - AVI
  - JPG
  - BMP
  - PNG
  - TIF
  - DCM (DICOM uncompressed)
  - DCM (DICOM-JPEG RGB/YBR)
  - DCM (DICOM-JPEG RGB/YBR Video)

- TPD (Picture Data)
- TVD (Video Data)

DICOM

- Verification SCU
- Modality Worklist (MWL) SCU
- Modality Performed Procedure Step (MPPS) SCU
- Store SCU (images, cines)
- Print SCU (grayscale, color)

Interface Customization

- the set of predefined skin schemes for software interface
- the set of predefined buttons images
- Multilanguage support, languages:
  - Chinese
  - English
  - German
  - Italian
  - Korean
  - Lithuanian
  - Magyar
  - Polish
  - Romanian
  - Russian
  - Spanish
- B+M, B+PW layout position, size
- ultrasound area size
- font size

General Measurements and Calculations

- B and Color Doppler mode general measurements and calculations
  - Distance
  - Length (method: 1 trace)
  - Area, Circumference (methods: 1 ellipse, 1 trace, 1 distance)
  - Volume (methods: 1 distance, 2 distances, 3 distances, 1 ellipse)
  - Angle (methods: 2 distances, 3 distances)
  - Stenosis % (methods: 2 distances, 2 ellipse or trace areas)
  - A/B Ratio (methods: 2 distances, 2 ellipse or trace areas, 2 ellipse or trace circumferences)
- M mode general measurements and calculations
  - Distance, Time, Velocity
  - Heart Rate (methods: 1 beat, 2 beats)
  - Stenosis % (method: 2 distances)
  - A/B Ratio (methods: 2 distances, 2 times, 2 velocities)

- PW mode general measurements and calculations
  - One-point PW measurements and calculations:
    - Velocity
    - Pressure Gradient (PG)
  - Two-points PW measurements and calculations:
    - Velocities difference
    - Pressure Gradients (PG) difference
    - Time interval
    - Acceleration
    - Resistivity Index (RI)
    - Heart Rate (methods: 1 beat, 2 beats)
    - Velocity minimum and maximum
    - Pressure Gradient (PG) minimum and maximum
  - Trace-based PW measurements and calculations:
    - Trace Time
    - Trace Velocity min, max, mean
    - Trace Pressure Gradient (PG) min, max, mean
    - Velocity Time Integral (VTI)
    - Pulsatility Index (PI)
  - A/B Ratios of one-point PW measurements:
    - Velocities A/B Ratio
    - Pressure Gradients (PG) A/B Ratio
  - A/B Ratios of two-point PW measurements:
    - Velocity differences A/B Ratio
    - Pressure Gradient (PG) differences A/B Ratio
    - Time differences A/B Ratio
    - Accelerations A/B Ratio
    - Resistivity Indexes A/B Ratio
  - A/B Ratios of trace-based PW measurements:
    - Velocity means A/B Ratio
    - Pressure Gradient (PG) means A/B Ratio
    - Pulsatility Indexes A/B Ratio
    - Velocity Time Integrals A/B Ratio

PW mode Human Cardiology measurements and calculations

- Left Ventricle: LVOT Diam, LVOT VTI, LVOT Vmax, SV (Stroke Volume), SI (Stroke Volume Index), CO (Cardiac Output), CI (Cardiac Index), dP:dt (Delta Pressure : Delta Time), MPI (Left Ventricle Myocardial Performance Index)
- Mitral Valve: MVA(PHT) (Mitral Valve Area using Pressure Half Time), MVA using Continuity Equation (LVOT Diam, MV VTI; LVOT Diam, MV Vmax), dP:dt, E/A ratio
- Aortic Valve: AVA (Aortic Valve Area) using Continuity Equation (LVOT Diam, AV VTI; LVOT Diam, AV Vmax), AVI (Aortic Valve Index), DPI (Dimensionless Performance Index), AV PHT (Aortic Valve Pressure Half Time)
- Right Ventricle: RVOT Diam, RVOT VTI, RVOT Vmax, dP:dt, RV MPI (Right Ventricle Myocardial Performance Index), MPAP (Mean Pulmonary Artery Pressure)
- Tricuspid Valve: TVA (Tricuspid Valve Area) using Continuity Equation (RVOT Diam, TV VTI; RVOT Diam, TV Vmax); TV E/A ratio, TV PHT

- Pulmonic Valve: PVA (Pulmonic Valve Area) using Continuity Equation (RVOT Diam, PV VTI; RVOT Diam, PV Vmax), PVI (Pulmonic Valve Index), DPI (Dimensionless Performance Index), PV PHT (Pulmonic Valve Pressure Half Time)
- Pulmonary Vein; Hepatic Vein
- Shunts: Qp:Qs (Pulmonary-Systemic Flow Ratio)

Human Measurements and Calculations Packages

- Human General calculations package
  - Measurements: the same as general measurements of different modes (B, M, PW)
  - Calculations: BSA via Height and Weight, BSA via Weight, Hip Angles (α, β), Femoral Head Coverage (FHC)
  - PW mode calculations: HR, SV using Flow Area, SV using Flow Diameter, SI, CO, CI, Area calculation using Continuity Equation (methods: Area and VTI, Area and Velocity, Diameter and VTI, Diameter and Velocity, Velocity Ratio (S/D, D/S), dP:dt, Flow Volume (methods: Diameter, Area), PHT, MVA
- Human Obstetrics / Gynecology (OB / GYN) calculations package
  - Measurements: LMP (entered or from calendar), AC, BPD, FL, HC, FTA, AAPD, ATD, TAPD, TTD, CRL, GS, HL, TL, UL, OFD, BOD, Cereb, Clav, Rad, AFI, FHR
  - Estimated date of birth (EDD) calculations: EDD(LMP), EDD(GA), EDD(AUA)
  - Ratios: FL / AC, FL / HC, FL / BPD, HC / AC, CI
  - Estimated Fetal Weight (EFW) calculations: EFW(AC), EFW(AC,BPD), EFW(AC,FL), EFW(AC,HC), EFW(AC,HC,BPD), EFW(FL), EFW(AC,FL,HC), EFW(AC,BPD,FL), EFW(AC,BPD,FL,HC), EFW(BPD,FL,FTA), EFW(BPD,ATD), EFW(BPD,TTD), EFW(BPD,TAPD,TTD), EFW(BPD,FL,TAPD,TTD)
  - Selected EFW values are used for calculation of Average EFW
  - Gestational Age (GA) calculations: GA(AC), GA(BPD), GA(CRL), GA(FL), GA(GS), GA(HC), GA(HL), GA(OFD), GA(TL), GA(UL), GA(HC/AC), GA(FTA),GA(ATD), GA(TAPD), GA(TTD), GA(BOD), GA(Cereb), GA(Clav)
  - Fetal Growth estimation (trending): AC(GA), BPD(GA), CRL(GA), FL(GA), GS(GA), HC(GA), HL(GA), OFD(GA), TL(GA), UL(GA), [FL/AC](GA), [FL/HC](GA), [HC/AC](GA), EFW(GA), AAPD(GA), ATD(GA), TAPD(GA), TTD(GA), BOD(GA), Cereb(GA), Rad(GA), Clav(GA), AFI(GA), FHR(GA)
  - Selected Growth Tables are visualized as Fetal Growth Curves
  - Software supports unlimited number of user-defined Growth Tables
- Human Gynecology (GYN)
  - Measurements: length, height, width of uterus, cervix, ovaries, renals, follicles
  - Calculations: volumes of uterus, cervix, ovaries, renals, follicles
- Human Abdominal exam measurements and calculations
  - Liver: Volume (CC, AP, LL diameters)
  - Gallbladder: Volume, Wall Thickness, Extrahepatic Bile Duct (EBD), Common Bile Duct (CBD), Common Hepatic Duct (CHD)
  - Pancreas: Head Diameter, Body Diameter, Tail Diameter, Pancreatic Duct

Head, Pancreatic Duct Body
    - Spleen: Volume (length, width, thickness)
    - Gastrointestinal Tract: Appendix Wall Thickness, Appendix Diameter, Bowel Wall Thickness (at Stomach, Small Bowel, Large Bowel)
    - Urinary Bladder: Volume (length, height, width)
    - Right / Left Kidney: Volume (length, height, width), Pelvis Diameter
- Human Urology
    - Measurements: length, height, width of kidneys, bladder, prostate, testes
    - Calculations: volumes of kidneys, bladder, prostate, testes; RUV (Residual Urine Volume)
- Human Endocrinology
    - Measurements: length, width, thickness of thyroid lobes
    - Calculations: volumes thyroid lobes; volume of thyroid
- Human Vascular exam measurements and calculations
    - Distance and area -based stenosis calculations at left (right) Subclavian, CCA (Common Carotid Artery), Bulb, ICA (Internal Carotid Artery), ECA (External Carotid Artery), Vertebral vessels at proximal, middle, distal locations
    - PSV/EDV (Peak Systole Velocity / End Diastole Velocity) ratios for each vessel and location
    - Ratios of velocities ICA PSV/CCA PSV, ICA EDV/CCA EDV, ICA PSV/CCA EDV, ECA PSV/CCA PSV, ECA EDV/CCA EDV, ECA PSV/CCA EDV at Rt. (Lt.) Prox. (Mid., Dist.) locations
- Human Cardiology
    - Software supports the following measurements of Left Ventricle, Aortic Valve, Left Atrial: IVSd (Interventricular Septal Thickness, diastole), LVIDd (Left Ventricle Internal Diameter, diastole), LVPWd (Left Ventricle Posterior Wall Thickness, diastole), AOd (Aortic Root Dimension, diastole), IVSs (Interventricular Septal Thickness, systole), LVIDs (Left Ventricle Internal Diameter, systole), LVPWs (Left Ventricle Posterior Wall Thickness, systole), LADs (Left Atrial Dimension, systole).
    - Calculations: HR (Heart Rate), BSA (Body surface Area), Left ventricle volume (methods: Cubed, Teichholz, Gibson, Simpson's LVAM-LVAP, Simpson's single plane, Simpson's biplane, Bullet, Ellipsoid single plane, Ellipsoid biplane), SV (Stroke Volume), SI (Stroke Volume Index), EF (Ejection Fraction), CO (Cardiac Output), CI (Cardiac Index), STIVS (Interventricular Shortening), FS (Fractional Shortening), STPW (Posterior Wall Shortening), LVM (Left Ventricle Cardiac Mass), CMI (Cardiac Mass Index), LA/AO Ratio

Human/Veterinary OB Gyn packages: software supports unlimited number of user-defined GA tables, selected GA values are used for calculation of Average GA (Average Ultrasound Age - AUA).
Human/Veterinary Cardiology measurements package automatically displays hint images that show where and how appropriate measurements must be performed.

Veterinary Calculations Packages

- Canine OB
    - Measurements: GS, CRL, HD, BD

	○ Gestational Age (GA) calculations: GA(BD), GA(CRL), GA(GS), GA(HD) • Feline OB ○ Measurements: HD, BD ○ Gestational Age (GA) calculations: GA(BD), GA(HD) • Ovine OB ○ Measurements: CRL ○ Gestational Age (GA) calculations: GA(CRL) • Bovine OB ○ Measurements: BD, CRL, HD, UD ○ Gestational Age (GA) calculations: GA(BD), GA(CRL), GA(HD), GA(UD) **Veterinary Calculations Packages** • Equine OB ○ Measurements: AOD, BPD, CRL, EOD, GS ○ Gestational Age (GA) calculations: GA(AOD), GA(BPD), GA(CRL), GA(EOD), GA(GS) • Llama OB ○ Measurements: BPD ○ Gestational Age (GA) calculations: GA(BPD) • Goat OB ○ Measurements: BPD ○ Gestational Age (GA) calculations: GA(BPD) for different species • Animal Cardiology ○ Left Ventricle, Aortic Valve, Left Atrial measurements: IVSd, LVIDd, LVPWd, AOd, IVSs, LVIDs, LVPWs, LADs, ET ○ Calculations: HR, LV volume (Cubed, Teichholz, Gibson), SV, EF, CO, STIVS, FS, STPW, LA/AO, VCF **Standard Configuration:** -Host 1 unit -Convex probe 1 pcs -Lienar or Trans-vaginal probe 1 pcs -Computer keyboard 1 pcs **Optional:** Linear, Trans-vaginal, Micro-convex, Trolley, Printer