see it all
MEDISON

Technical Description

VERSION 1.01.00

ACCUVIX V10

YOUR CLEAREST VIEW WITHIN

www.medison.com | info@medison.com

Your Clearest View Within

Experience the new generation of ACCUVIX.

Meet the ACCUVIX V10, combining futuristic state-of-the-art technology and outstanding user-interface design. The new ACCUVIX V10 contains cutting-edge 2D, 3D and 4D image technologies: Dynamic MR™, SRF (Speckle Reduction Filter)™, 3D XI™, VOCAL™ and XI VOCAL™. The innovative system platform ensures optimal patient throughput.
A 17-inch flat-panel display, set on an articulating arm, delivers superb operator convenience and high-resolution images.

1 SYSTEM FEATURES

The system provides multipurpose applications including abdominal, vascular, small parts, obstetrics, gynecology, urology, neonatal & pediatrics, cardiology, TCD etc. The system provides high quality of image resolution and sensitivity in all scanning modes including B/C/D/M/CW/CM mode. The system supports probes of convex, linear, phased array, endo-cavity, and 3D volume probes for abdominal, linear and endo-cavity. The system supports DICOM 3.0 and can be easily connected to PACS networking.

2 SYSTEM OVERVIEW

The configuration of ACCUVIX V10 is as follows,

Module	Description
Ultrasound module	Ultrasound Engine Modules: Frontplane, CW, Beamformer, BE, Software DSC, Backplane, ECG
CPU module	Main host CPU: CPU card including Pentium IV 2GHz processor, max. 2GB main memory, VGA/LAN/Sound functions, and Interfacing function to Ultrasound module
Key module	Key Interface, Key Matrix, Trackball unit
Rear module	System Output part: Rear Left/Right
Software module	Main control, Measurements, DB engine, SonoView II, 3Dview, etc.
Mechanical Design / Enclosure module	Rack, Housing, Chassis, etc.
Power supply module	ADM, DDM, PC Power
Monitor module	17" LCD high resolution monitor

3 MAIN FEATURE LISTS

- Real time 129,024 channel 2D gray-scaled imaging with multi-beam receiving
- Multibeam Beamformers with:
  - » Dynamic Focus
  - » Dynamic Aperture
  - » Dynamic Apodization
  - » The shape of the acoustic spectrum
- Synthetic Aperture Control
- Spatial Compound Imaging™ (SCI)

: Several steered scans of an object are acquired from different view angles and then combined to form a compound image which is reduced speckle noises and improve image quality

- Motion mode (M-mode)
- Color Motion mode (CM-mode)
- Color Doppler Imaging with Quad-beam receiving
- Power Doppler Imaging with Quad-beam receiving
- Directional Power Doppler
- Pulsed wave (PW) spectral Doppler
- Multi frequency Doppler
- Tissue Harmonic Imaging
- Pulse Inversion Harmonic Imaging
- Tissue Doppler Imaging
- Stress Echo Imaging(to be updated)
- Contrast Agent (to be updated)
- Extreme High Dynamic Range (170dB)
- Full Spectrum Imaging™
- Power Pulse Inversion Harmonic Imaging
- Trapezoidal Imaging
- Color Edge Processing
- Combined modes
  - » B/M, B/PWD, B/C, B/PD, B/DPD, B/PPI, B/TDB, B/CWD
  - » B/C/PWD, B/PD/PWD, B/DPD/PWD,B/PPI/PWD,B/TD/PWD,B/C/M, B/C/CWD, B/PD/CWD
  - » Dual Live mode (2D/C, 2D/PD)
  - » Dual Mode
  - » Quad Mode
- Cine for 10,000 frames and Loop Review for 8,192 lines
- Clip Cine Store
- Color VGA monitor with non-interlaced display
- Integrated 3D Imaging Package
- Freehand 3D, Static 3D, Live 4D
- VOCAL
- SHELL Histogram
- Multi-Slice View

: Multi-Slice View transforms 3D volume data obtained from a regular ultrasound scan into a series of sequential images captured in intervals of 0.5mm to 5.0mm segments. Enables instantly view, analyze, and understand more in-depth data.

- Oblique

: Oblique View is imaging technology which enables physicians to examine and view 3D volume data in various planes of view without limitations. The acquired portion of the 3D data allows complete visual examination and better understanding of the correlation between organs and other areas within the region of interest.

  - » Static Line Oblique
  - » Dynamic Line Oblique
  - » Contour Oblique
- Volume CT

: VolumeCT view technology with Cross View and Cube Sectional View functions enables physicians to perform multiple examinations on multiple regions of interest and visually displays their relationships from just one 3D volume scan data.

  - » Cube VolumeCT
  - » Cross VolumeCT
- MagiCut
- Speckle Reduction Filter™ (SRF)

: Our SRF technology can eliminate speckle noise and small artifacts without distorting the texture boundary by applying a 3-step noise reduction filtering process to the existing 2D image, thus providing an outstanding natural and smooth image.

- DynamicMR™ (Optional)

: DynamicMR transforms fundamental 2D image by noise and artifacts reduction and edge-enhancement resulting in, improving tissue conspicuity and margin definition.

- XI STIC™(Optional)

: Quickly obtain a full fetal cycle beating in real time and save volume for later analysis.

  - » STIC
  - » STIC plus Multi-Slice View
- 4 Active Array Ports (pencil probe port is optional)
- QuickScan™
- Real-Time Auto Calculation
- DICOM 3.0 compatible Image filing: SonoView II
- SonoView II Image management
- Integrated and DVD RW(CD R/W) drive and USB2.0(8 ports) drive
- Various Measurement Packages
- Applications
  - » General, Obstetrics, Obstetrics Early, Fetal Heart, Gynecology, Urology, Breast, Small Parts,
  - » Renal, Vascular, Pediatric, Abdomen, , Musculoskeletal
  - » Adult Cardiology, Pediatric Cardiology, TCD, Neonatal
- Peripheral output device support
- Language support: English, German, Spanish, Italian, and French
- HPRF
- Free Angle M-Mode
- Post measurement
- Post image optimizing process
- Help function
- Panoramic View (to be updated)
- Stress Echo Imaging(to be updated)
- Contrast Agent (to be updated)

4 SCANHEADS

- Curved Array: C2-6IC, C2-5EL, C3-7IM, C4-9/10ED, EC4-9IS, NEV4-9ES, NER4-9ES
- Linear Array: L6-12IS, L8-15IS, L5-12/50EP, L4-7EL, L5-13IS, L7-16IS
- Volume Scanhead: 3D2-6ET, 3D4-8ET, 3D5-9EK, 3D4-9ES
- Phased Array: P2-4AC, P3-5AC
- Pencil Probe: 2.0M CW, 4.0M CW

4.1 C2-6IC

- Application : Abdomen, OB/GYN,Vasculoar,Urology,Contrast agent
- Probe Type : Curved Linear Array
- Center Frequency : 3.3[MHz]
- Radius of Curvature : 60[mm]
- Field of View : 58.12[°]
- Number of Elements : 192
- Element Pitch : 0.317[mm]
- Elevation Aperture : 12[mm]
- Geometric Focus : 70[mm]
- Biopsy guide available
- Safety class: BF

4.2 C5-2EL

- Application : Abdomen, OB/GYN,Vasular,urology
- Probe Type : Curved Linear Array
- Center Frequency : 3.2[MHz]
- Radius of Curvature : 40[mm]
- Field of View : 75.54[°]
- Number of Elements : 128
- Element Pitch : 0.412[mm]
- Elevation Aperture : 13[mm]
- Geometric Focus : 80[mm]
- Biopsy guide available
- Safety class: BF

4.3 C3-7IM

- Application : Abdomen, OB/GYN,Vascular,Urology,Pediatrics,Contrast agent
- Probe Type : Curved Linear Array
- Center Frequency : 5.0[MHz]
- Radius of Curvature : 50[mm]
- Field of View : 77.5[°]
- Number of Elements : 192
- Element Pitch : 0.352[mm]
- Elevation Aperture : 11[mm]
- Geometric Focus : 70[mm]
- Biopsy guide available
- Safety class: BF

4.4 C4-9/10ED

- Application:Pediatric,Apendix
- Probe type: Curved Linear Array
- Center Frequency:6.5Mhz
- Radius of Curvature:10[mm]
- Field of View:150.42
- Doppler TX fequency:4.4MHz
- Number of Elements:128
- Element Pitch:0.205[mm]

- Geometric Focus:38.0[mm]
- Biopsy guide available
- Safety class:BF

4.5 EC4-9IS

- Application : OB/GYN, Urology
- Probe Type : Endocavity
- Center Frequency : 6.5[MHz]
- Radius of Curvature : 10[mm]
- Field of View : 148.9[°]
- Number of Elements : 192
- Element Pitch : 0.138[mm]
- Elevation Aperture : 6[mm]
- Geometric Focus : 35.0[mm]
- Biopsy guide available
- Safety class: BF

4.6 NEV4-9ES

- Application : OB (Fetal heart, Cervix), Gynecology (Uterus, Adnexa, Endometrium), Urology (Prostate, Bladder)
- Probe type: Endocavity
- Center Frequency: 6.5Mhz
- Radius of Curvature: 10[mm]
- Field of View: 150[°]
- Doppler TX fequency: 4.4MHz
- Number of Elements: 128
- Element Pitch: 0.205[mm]
- Geometric Focus: 60.0[mm]
- Biopsy guide available
- Safety class: BF

4.7 NER4-9ES

- Application:OB (Fetal heart, Cervix), Gynecology (Uterus, Adnexa, Endometrium), Urology (Prostate, Bladder)
- Probe type: Endocavity
- Center Frequency: 6.5Mhz
- Radius of Curvature: 10[mm]
- Field of View: 150[°]
- Doppler TX fequency: 4.4MHz
- Number of Elements: 128
- Element Pitch: 0.205[mm]
- Geometric Focus: 60.0[mm]
- Biopsy guide available
- Safety class: BF

4.8 L6-12IS

- Application :Breast, Small Parts, Vascular, Musculoskeletal, Pediatrics

- Probe Type : Linear Array
- Center Frequency : 8.0[MHz]
- Radius of Curvature : Flat
- Field of View : 38.4[mm]
- Number of Elements : 192
- Element Pitch : 0.2[mm]
- Elevation Aperture : 4[mm]
- Geometric Focus : 20.0[mm]
- Biopsy guide available
- Safety class: BF

4.9 L5-13IS

- Application: Breast, Small Parts, Vascular, Musculoskeletal, Pediatrics
- Probe Type: Linear Array
- Center Frequency: 9.0[MHz]
- Radius of Curvature: Flat
- Field of View: 38.4[mm]
- Number of Elements: 192
- Element Pitch: 0.2[mm]
- Elevation Aperture: 4[mm]
- Geometric Focus: 20.0[mm]
- Biopsy guide available
- Safety class: BF

4.10 L8-15IS

- Application : Breast, Small Parts, Vascular, Musculoskeletal, Pediatric, Superficial
- Probe Type : Linear Array
- Center Frequency : 12.0[MHz]
- Radius of Curvature : Flat
- Field of View : 38.4[mm]
- Number of Elements : 192
- Element Pitch : 0.2[mm]
- Elevation Aperture : 4[mm]
- Geometric Focus : 15.0[mm]
- Biopsy guide available
- Safety class: BF

4.11 L7-16IS

- Application: Breast, Small Parts, Vascular, Musculoskeletal, Pediatrics, Superficial
- Probe Type: Linear Array
- Center Frequency: 12.5[MHz]
- Radius of Curvature: Flat
- Field of View: 38.4[mm]
- Number of Elements: 192
- Element Pitch: 0.2[mm]
- Elevation Aperture: 4[mm]
- Geometric Focus: 20.0[mm]
- Biopsy guide available

- Safety class: BF

4.12 L5-12/50EP

- Application : Breast, Small Parts, Vascular, Musculoskeletal, Pediatrics
- Probe Type : Linear Array
- Center Frequency : 7.5[MHz]
- Radius of Curvature : Flat
- Field of View : 50[mm]
- Number of Elements : 128
- Element Pitch : 0.39[mm]
- Elevation Aperture : 6[mm]
- Geometric Focus : 22.0[mm]
- Biopsy guide available
- Safety class: BF

4.13 L4-7EL

- Application : Breast,Vascular, Small Parts, Musculoskeletal,Pediatrics
- Probe Type : Linear Array
- Center Frequency : 5.0[MHz]
- Radius of Curvature : Flat
- Field of View : 38.4[mm]
- Number of Elements : 128
- Element Pitch : 0.3 [mm]
- Elevation Aperture : 5[mm]
- Geometric Focus : 20.0[mm]
- Biopsy guide available
- Safety class: BF

4.14 3D4-8ET

- Application : Abdomen, OB, GYN
- Probe Type : 3D Curved Linear
- Center Frequency : 4.5[MHz]
- Radius of Curvature : 40[mm]
- Volume angle : 70[°]
- Field of view : 84[°]
- Number of Elements : 128
- Element Pitch : 0.375[mm]
- Elevation Aperture : 13[mm]
- Geometric Focus : 60[mm]
- Biopsy guide available
- Safety class: BF

4.15 3D2-6ET

- Application : Abdomen, OB/GYN
- Probe Type : 3D Curved Linear
- Center Frequency : 3.5[MHz]
- Radius of Curvature : 40[mm]
- Volume angle : 70[°]

- Field of view :84[°]
- Number of Elements : 128
- Element Pitch : 0.468[mm]
- Elevation Aperture : 13[mm]
- Geometric Focus : 80[mm]
- Biopsy guide available
- Safety class: BF

4.16 3D4-9ES

- Application : OB/GYN, Urology
- Probe Type : 3D Curved Linear
- Center Frequency : 6.5[MHz]
- Radius of Curvature : 10[mm]
- Volume angle :90[°]
- Field of view : 150[°]
- Number of Elements : 128
- Element Pitch : 0.205[mm]
- Elevation Aperture : 8[mm]
- Geometric Focus : 20[mm]
- Biopsy guide available
- Safety class: BF

4.17 3D5-9EK

- Application: General, OB, Gyn, Urology
- Probe Type: 3D Curved Linear
- Center Frequency: 6.5[MHz]
- Radius of Curvature: 11.65[mm]
- Field of View: 146[degree]
- Number of Elements: 128
- Element Pitch: 0.1964[mm]
- Elevation Aperture: 6[mm]
- Geometric Focus: 30.0[mm]
- Biopsy guide available
- Safety class: BF

4.18 P2-4AC

- Application : Adult cardiac, Pediatric cardiac, Renal, Aorta, TCD
- Probe Type : Phased Array
- Center Frequency : 2.5[MHz]
- Radius of Curvature : Flat
- Field of View : 19.2[mm]
- Number of Elements : 64
- Element Pitch : 0.3[mm]
- Elevation Aperture : 14[mm]
- Geometric Focus : 85.0[mm]
- Biopsy guide available
- Safety class: BF

4.19 P3-5AC

- Application : Adult cardiac, Pediatric cardiac, Renal, Aorta, TCD
- Probe Type : Phased Array
- Center Frequency : 4.0[MHz]
- Radius of Curvature : Flat
- Field of View : 14.1[mm]
- Number of Elements : 64
- Element Pitch : 0.22[mm]
- Elevation Aperture : 12[mm]
- Geometric Focus : 70.0[mm]
- Biopsy guide available
- Safety class: BF

4.20 CW2.0

- Application : Cardiology, TCD
- Probe Type : Pencil type
- Center Frequency : 2.0[MHz]
- Acoustic aperture: 13.8[mm]
- Elevation focus depth : 55[mm]
- Safety class: BF

4.21 CW4.0

- Application : Cardiology, TCD
- Probe Type : Pencil type
- Center Frequency : 4.0 [MHz]
- Acoustic aperture: 7.0[mm]
- Elevation focus depth : 45[mm]
- Safety class: BF

5 SYSTEM PLATFORM EXTENSIONS

- Additional scanhead
  - » C1-4EC (Curved 2.5MHz/ 62.5R/ 128 element/ Adult Cardiac, Pediatric)
  - » LS5-13EC (Plat 9.0Mhz/ 128element/ Hotkeystic probe/ superficial part, MSK)
  - » P3-7AC (Phased Array 5.0M/ 10mm/ 64element/ Pediatric)
  - » MPTEE (Adult echo)
- Additional Function
  - » Stress echo
  - » Panoramic Imaging
  - » Contrast agent
  - » Color STIC

6 DETAIL SYSTEM SPECIFICATIONS

6.1 Applications

- Abdominal
- Obstetrical
- Obstetrical Early
- Neonatal

- Peripheral vascular
- Gynecological and fertility
- Infertility
- Small parts (breast, thyroid, parathyroid, penis, testes)
- Abdominal surgery
- Renal
- Breast
- Musculoskeletal
- Pediatric
- Prostate
- Trans-Rectal
- Trans-Vaginal
- Adult Cardiology
- Pediatric Cardiology
- TCD
- Vascular

6.2 ERGONOMICS

- Advanced ergonomic key grouping
- Durable design
- Prevention of noise of the system
- Tilt and swivel articulation arm monitor
- 4 active transducer ports for simultaneous transducer connection(include pencil probe)
- High quality stereo audio speaker system
- Input and output connections on the rear panel
- Rear compartment for storage of accessories
- The rear handle
- Attachable key panel
- Lighted alphanumeric keyboard
- Rotate control panel
- 4 Back USB ports (for digital connection of peripherals)
- 2 Front USB ports(for used memory stick and external hard drive connection)

6.3 CONTROL PANEL

- DDedicated keyboard controls
- Central home position controls(Movement control panel)
- Shortcuts for many functions
- Functional grouping of keys
- Positive feedback on control actuation
- Indicator lights identify activated keys
- Lighting of control panel labels
- Peripherals controlled through the system keyboard
- Track Ball 1-Unit
- 2-button footswitch
- Audio volume control
- On access to system power On/Off button
- Rotates 50°

6.4 MONITOR

- 17" high resolution LCD non-interlace color monitor
- Resolution: 1280x1024x24bit
- High brightness & contrast
- Monitor Moving
  - » Lift
  - » Tilt
  - » Swivel

6.5 DISPLAYED LEVELS OF GRAY AND COLOR

- 256 shades of gray, 8 bits
- 16,777,216 colors, 8 bits for each RGB component

6.6 SCAN FORMATS

- Linear Array
- Curved Array
- Pased Array
- Mechanical Array
- High Resolution Zoom

6.7 ACOUSTIC OUTPUT MANAGEMENT

- User selectable, transducer and scanning mode dependent
- Dedicated Output Display on the system monitor display of output acoustic power level, as well as thermal and mechanical indices:
- PWR – Output Power level. Range: From 10 % of maximum output, output level is increased by 5% in each step.
- MI – Mechanical Index
  - » TIC – Thermal Index, Bone at Surface
  - » TIB – Thermal Index, Bone at Focus
  - » TIS – Thermal Index, Soft Tissue

6.8 DATA FIELD DISPLAY

- Date, Time, Transducer in use
- Frequency range in operation (2-D)
- Image depth
- Setting name
- Frame rate (Hz)
- Imaging Cine frame number
- Dynamic range (dB) in 2-D
- Enhance setting in 2-D
- Persistence in 2-D
- Postprocessing in 2-D
- Gain settings: 2-D
- Time Gain Compensation curve (TGC)
- Transmit focus location
- Age/birth
- Additional Info.(Complex mode) display case : age/birth/gender, Probe, Image stored

6.9 PATIENT REPORT PAGE

- Customizable patient and physician information for each study

6.10 BODY MARKERS

- Body markers organized in many anatomical groups
- Adjustable position, rotation and size of the body marker and transducer indicator on the screen

6.11 IMAGE ANNOTATIONS

- Factory pre-set standard annotation terms
- Adjustable Annotation Arrow
- Screen annotation capability through alphanumeric keyboard

6.12 APPLICATION AND SETTING FUNCTIONS

- The Application and Settings function
- Dedicated Application key
- Dedicated Settings key
- Settings-specific programs
- Direct access to Settings and Applications during the examination
- Default Program set-up for each Category
- Backup storage and retrieval of the Programs and Applications through DVD media
- Factory pre-set Programs and Applications protected from alteration and deletion

6.13 TRANSMIT FOCAL ZONE ENHANCEMENT

- User-selectable position and number of Transmit Focal Zone settings through a knob button

6.14 DISPLAY DYNAMIC RANGE

- User selectable in 1 dB increments
- Dynamic Range : 50~170 dB

6.15 FRAME RATE

- Max. above 700 fps(dependent on transducer, field of view, depth and angle)

6.16 INVERT OPTIONS

- Up/down
- Right/left
- Rotation

6.17 DEPTH SELECTION

- Range: from 2 to 30cm
- Linear Array : 2~8.5cm
- Phased Array : 6~30cm
- Endocavity : 3~18cm
- Convex : 6~30cm

6.18 TIME GAIN COMPENSATION

- Eight slide-pot controls
- Reassigned on HRZ, Depth and U/D Invert adjustments

6.19 IMAGE PROCESSING PARAMETERS

- 2 D Gain : 0~100 (1%)
- Power:10~100(5%)
- Edge Enhance :-3~3(1step)
- Frame Average : 0~15(1step)
- 2D Filter
- View area
- View area Steering
- Dynamic Range
  - » High dynamic --> "soft gray" image
  - » Low dynamic --> "hard gray" image
- Reject
  - » Reject range max.: 255
  - » Reject range min.: 0
  - » step with: 1
- Gray map :7step (type:1~5,user1~2)
- Chroma map :0~360range
- Trapezoidal Image
- U/D Flip,L/R Flip
- Frame Rate : Slow/Normal/Fast(3step)
- Frequency optimized setting
  - » Pen(penetration)/Gen(general)/Res(resolution) :3 step
- Tissue
  - » Solid
  - » Normal
  - » Adipose
  - » Cystic
- Density
  - » High
  - » Middle
  - » Low
- Harmonic Image
- Pulse Inversion Harmonic Image
- PPI(Power Pulse Inversion)
- Full Spectrum Image

6.20 HIGH RESOLUTION ZOOM

- Available in full size dual and quad display in 2D and color Doppler mode
  - » Read Zoom : 50~400(%)
  - » Write Zoom : 100~400(%)

6.21 CALIPERS AND GENEAL MEASUREMENTS

- 4 pairs of 2-D calipers available. Screen display:
  - » Distance between calipers for each pair
  - » Manual tracing in 2D distance
- Ellipse function: Up to 4 pairs of calipers
  - » Distance between calipers
  - » Ellipse circumference

- » Ellipse area
- Trace function. Displays:
  - » Trace circumference
  - » Traced area
- Minimum distance between calipers:
  - » Transducer type, depth and HRZ box setting dependent

6.22 IMAGE CINE MEMORY

- Available in all modes(include loop)
- Imaging Cine, for real-time acquisition and review of 2-D
- After freezing immediate scrolling through Cine memory with the Track ball
- Number of frames or seconds of information in Cine memory depends on:
  - » Mode in use
  - » Image adjustment
  - » Amount of information displayed (2-D image size, etc)
  - » Memory allocated for Cine
- Measurement and calculation capability

6.23 VOLUME MODE

- Live 3D, Static 3D, Freehand 3D
- Multi-planar view display
- Multi-Slice View
- Oblique
  - » Static Line Oblique view
  - » Dynamic Line Oblique view
  - » Contour Oblique view
- Volume CT
  - » Cube Volume CT
  - » Cross Volume CT
- XI STIC™
  - » STIC
  - » STIC plus Multi-Slice View
- 3D DMR™
- VOCAL
- SHELL
- Optimal volume resolution
- Various 3D rendering algorithm
  - » Surface mode
  - » Maximum transparent mode
  - » Minimum transparent mode
  - » X-ray mode
- SeeThru mode
- MagiCut Plus
- Number of Volume CINE : 128
- Cartesian format 3D data save

6.24 2D MODE

- Gray scale: max 256 level(8bit)

- Scan line: max 1024line
- Image format: Convex, Linear, Phased array
- Transmit Focus: Predetermined points (max.8)
  Multi-zone Focal point (max.4)
- Zoom: Read zoom/Write zoom
- Frequency: Pen, Gen, Res
- Full Spectrum Imaging : 1/2/3 step
- Angle of the sector/convex: optimized by all probes
- Spatial Compound is available(only linear probes)
- Orientation control: 0°/90°/180°/270°
- Panning: Positioning X, Positioning Y
- Dual/Quad control
- Quickscan
- Biopsy Guideline contol

6.25 HARMONIC MODE

- Harmonic/Pulse Inversion/Power Pulse Inversion

6.26 M MODE

- Dynamic Range: 50~170dB, 1dB steps
- Gray Scale: max.256level(8bit)
- Sweep speed: 60/120/180/200/240/300/360Hz 6steps
- M gray scale map : 8steps
- M edge enhancement: 9steps(-3~3)
- M colorization: 9 chroma map
- M-color flow mode
- Loop Format: Top/Bottom,Left/Right
- Free Angle M mode: Fixed M Line
- Loop cine memory: max. 8192line
- ECG trace

6.27 SPECTRAL DOPPLER MODE(PW)

- Transmit frequency range: depending on probe
- Gray scale map: type1~5,User1~2(7steps)
- PW wall filter: 4steps(factory setup in 64 steps, from 0.04 PRF to 0.272 PRF, -3dB point)
- PW sweep speed: 60/120/180/240/300/360Hz 6steps
- Sample volume length: 0.5~15.0mm
- PRF: 1~23KHz
- Velocity scale range(depending on probe frequency)
  - » 0°, Max. zero shift range: 5.0cm/s ~ 3.4m/s
  - » 60°, Max. zero shift range: 10cm/s ~ 6.81m/s
- Spectrum Inversion
- Doppler Auto Trace
- Dynamic range: 1~4
- Angle correction: -70~70
- Baseline: 0~8steps
- Pseudo color: 0~360(10steps)
- Wall filter:0~3level

6.28 COLOR DOPPLER MODE

- Frequency range: (depending on probe, 2steps pen and gen)
- Color map: 8maps
- Velocity scale range(depending on probe): 2.4cm/s ~ 3.325m/s
- PRF: 600Hz~14KHz
- Min.velocity: 2.4cm/sec(system setup dependent)
- Max velocity: 3.325m/sec
- Ensemble: 8 ~ 31, step size 1
- Frame Rate: 2~47Hz
- Frame Average: 0~9level
- CD spectrum inversion
- Read zoom
- Color display mode
  - » Velocity
  - » Power
  - » Variance
  - » Velocity + Variance
- Real-time triplex mode: B+CD/PW in any depth
- Maximum steerable angle +/- 25°

6.29 POWER DOPPLER MODE

- Frequency range: (depending on probe, 2steps pen and gen)
- Color map: 8maps
- Velocity scale range(depending on probe): 2.4cm/s ~ 3.325m/s
- PRF: 600Hz~14KHz
- Ensemble: 8 ~ 31, step size 1
- Directional Power Doppler Imaging

6.30 COLOR M MODE

- Maximum PRF: 14kHz
- Minimum PRF: 1.5kHz
- Sweep speed : 60/120/180/240Hz 4steps

6.31 CW DOPPLER MODE

- Transmit frequency range:
- Gray scale map:
- CW wall filter: 4steps(factory setup in 64 steps, from 0.04 PRF to 0.272 PRF, -3dB point)
- CW sweep speed: 60/120/180/240/300/360Hz
- Sample volume length: 0.5~15.0mm
- PRF: 1.5~43KHz
- Velocity scale range(depending on probe frequency): 19.25cm/s ~ 8.23m/s
- Spectrum Inversion
- Doppler Auto Trace

7 ULTRASOUND WORKSTATION

- Pentium VI Processor 2GHz
- Main Memory: DDR2 SDRAM (Min.512MB)
- Hard drive: SATA HDD(80 GB)
- ODD: DVD Multi Recordable Driver
- LAN: 10BASE-T
- USB2.0
- Windows Embeded
- DVD R/W

8 MEASUREMENT PACKAGE

Function	Description		
Measurement	B mode: distance, line trace, angle, area, ellipse, circumference, volume		
	D mode: velocity, pressure, acceleration, deceleration		
	M mode: time, slope, distance		
OB measures	Mode	Menu Group	Items
	B	Fetal Biometry	GS, CRL, YS, BPD, OFD, HC(BPD, OFD)*, APD, TAD, AC(APD, TAD)*, FTA(APD, TADD)*, ThC(APTD, TTD)*, FL, SL, TTD, APTD, APTD, TTD, BPD,HC Calculation: MAD(APD,TAD)*, APTDxTTD(APTD, TTD)*
		Fetal Long Bones	HUM, ULNA, TIB, RAD, FIB, CLAV, Vertebral, NB
		Fetal Cranium	CEREB, OOD, IOD, CM, NF, NT, Lat Vent., HW
		Fetal Others	Foot, Ear, MP, Lt. Kidney, Rt Kidney, Pelvis, Lt.Renal AP, Rt.Renal AP
		AFI	Q1, Q2, Q3, Q4, MVP(Maximum Vertical Pocket)
		CTAR	ThD ap, ThD trans, HrtD ap, HrtD trans, ThA, HrtA Calculation: CTAR(D), CTAR(A)
	D	PLI	Sys Flow, Dias Flow, A. Rev Flow
	BD	Umb. Artery (Umbilical Artery)	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		MCA (Mid Cerebral Artery)	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Lt. Uterine Artery	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Rt. Uterine Artery	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Plac. Artery (Placenta Artery)	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Lt. Fetal Carotids	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Rt. Fetal Carotids	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Fetal Aorta	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		Ductus Venosus	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist

Function		Description		
		D	Renal Artery	Auto Trace, Limited Trace, Manual Trace, PSV, EDV
		BD	Volume Flow	Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Area, Vesl. Dist
		D	Fetal HR	
		N/A	Fetal Description	Gender, Fetal Position, Fetal Head, Fetal Spine, Placenta Location, Placenta Grade, 3 V Cord, Cord Insertion, Amniotic Fluid, Face
			Fetal Heart	4 Chamber, Lt. Outflow Tract, Rt. Outflow Tract, 3 Vessel, Aortic Arch, Cardiac Rhythm
			Fetal Brain	Lateral Ventricles, Cerebellum, Cist Magna, Cranium
			Fetal Abdomen	Abdominal Wall, Spine, Stomach, Bladder, Bowel, Lt. Kidney, Rt. Kidney, UE Artery, LE Artery
			Biophysicial Profile (Range: 0-2)	Nonstress Test, Fetal Movements, Fetal Breathing Movements, Fetal Tone, Amniotic Fluid Volume, Total
			Maternal Survey	Cervix, Uterus, Lt. Ovary, Rt. Ovary, Adnexa, Kidneys
			Comment	
OB Biometric References	Fetal Biometry	**Item**	**Table**	**Reference**
		GS	GA	None, Hellman, Korean, Nyberg, Tokyo, Hansmann, Rempen
			Growth	None, Rempen
		CRL	GA	None, Hadlock, Hansmann, Korean, Nelson, Osaka, Rempen, Robinson, Shinozuka
			Growth	None, Hansmann, Korean, Osaka, Shinozuka, ASUM(SCW), Rempen
		YS	GA	None
			Growth	None
		BPD	GA	None, Campbell, Chitty(Out-In), Chitty(Out-Out), Hadlock, Jeanty, Korean, Kurtz, Merz, Osaka, Sabbagha, Shinozuka, Bessis, Hansmann, Johnsen, Rempen, CFEF
			Growth	None, Chitty(Out-In), Chitty(Out-Out), Hadlock, Hansmann, Korean, Merz, Osaka, Shinozuka, ASUM(SCW), CFEF, Johnsen, Kumanavicius, Rempen, Nicolaides
		OFD	GA	None, Korean, Hansmann
			Growth	None, Hansmann, Korean, ASUM(SCW), Kumanavicius, Nicolaides
		HC	GA	None, Campbell, Chitty(m), Chitty(d), Hadlock, Korean, Merz, Hansmann, Johnsen, CFEF
			Growth	None, Chitty(m), Chitty(d), Hadlock, Hansmann, Korean, Merz, CFEF, ASUM(SCW), Johnsen, Kumanavicius, Nicolaides
		APD	GA	None, Bessis
			Growth	None, Hansmann
		TAD	GA	None, CFEF
			Growth	None, CFEF
		MAD	GA	None, Eik-NesSH

Function	Description		
		Growth	None, Eik-NesSH, Johnsen, Kumanavicius
	AC	GA	None, Campbell, Hadlock, Korean, Merz, Shinozuka, Hansmann, CFEF
		Growth	None, Campbell, Chitty(m), Chitty(d), Hadlock, Jeanty, Korean, Merz, Shinozuka, ASUM(SCW), CFEF, Johnsen, Kumanavicius, Nicolaides
	FTA	GA	None, Osaka
		Growth	None, Osaka
	ThC	GA	None
		Growth	None, Chitkara
	FL	GA	None, Campbell, Chitty, Hadlock, Hohler, Jeanty, Korean, Merz, Osaka, Shinozuka, Bessis, Doubilet, Hansmann, Johnsen, CFEF
		Growth	None, Campbell, Chitty, Hadlock, Hansmann, Jeanty, Korean, Merz, Osaka, Shinozuka, ASUM(SCW), CFEF, Johnsen, Kumanavicius, Nicolaides
	SL	GA	None
		Growth	None
	TTD	GA	None, Hansmann
		Growth	None, Hansmann
	APTD	GA	None, Hansmann
		Growth	None, Hansmann
	APTDxTTD	GA	None, Shinozuka
		Growth	None, Shinozuka
Fetal Long Bones	HUM	GA	None, Jeanty, Korean, Osaka, Merz
		Growth	None, Jeanty, Korean, Merz, Osaka, ASUM(SCW) , Hansmann
	ULNA	GA	None, Jeanty
		Growth	None, Jeanty, Merz, Hansmann
	TIB	GA	None, Jeanty
		Growth	None, Jeanty, Merz, Hansmann
	RAD	GA	None
		Growth	None, Merz, Jeanty, Hansmann
	FIB	GA	None
		Growth	None, Jeanty, Hansmann
	CLAV	GA	None, Yarkoni
		Growth	None, Yarkoni
	Vertebral	GA	None, Tokyo
		Growth	None
	NB	GA	None
		Growth	None
Fetal Cranium	CEREB	GA	None, Chitty, Hill
		Growth	None, Goldstein, Nicolaides
	OOD	GA	Jeanty
		Growth	None, Hansmann
	IOD	GA	None

Function		Description		
			Growth	None, Hansmann
		CM	GA	None
			Growth	None, Nicolaides
		NF	GA	None
			Growth	None
		NT	GA	None
			Growth	None, Yagel
		Lat Vent	GA	None
			Growth	None, Johnsen
	Fetal Others	Foot	GA	None
			Growth	None
		Ear	GA	None
			Growth	None
		MP	GA	None
			Growth	None
		Lt. Renal L	GA	None
			FG	None, Hansmann
		Rt. Renal L	GA	None
			FG	None, Hansmann
		Lt. Renal AP	GA	None
			FG	None, Hansmann
		Rt. Renal AP	GA	None
			FG	None, Hansmann
		Lt. Kidney	GA	None
			Growth	None
		Rt. Kidney	GA	None
			Growth	None
		Pelvis	GA	None
			Growth	None
OB EFW references		EFW	EFW equation	None, Campbell, Hadlock, Hadlock1, Hadlock2, Hadlock3, Hadlock4, Hansmann, Merz, Osaka, Shepard, Shinozuka1, Shinozuka2, Shinozuka3, Ferrero, Higginbottom, Thurnau, Warsof, Weiner1, Weiner2, Woo
			EFW Growth	None, Hadlock, Osaka, Shinozuka, Doubilet, Brenner, Williams, Yarkoni, Hansmann, Johnsen
Other References (Calc &Graph)	Ratio Calcul-ations	FL/BPD		Hohler
		FL/HC		Hadlock
		FL/AC		Hadlock
		FL/Foot		Campbell
		CI(BPD/OFD)		Hadlock
		HC/AC		Campbell
		ThC/AC		Chitkara
		Lat. Vent/HW		Johnson
	Fetal Doppler	MCA PI Trend		Shinozuka
		MCA RI Trend		Shinozuka

Function		Description		
	trend	UA PI Trend		Shinozuka
	graph	UA RI Trend		Shinozuka
	Trend	AF Index		Moore
	graph	HC/AC		Campbell
		FL/HC		Hadlock
		Lat. Vent/HW		Johnson
GYN measurements		**Mode**	**Menu Group**	**Items**
		B	Uterus	Length, Height, Width, Endo Thickness, Cervix Length, Cervix Height, Cervix Width Calculation: Volume, Cervix Volume
			Cyst	Length, Height, Width Calculation: Volume
			Rt. / Lt. Ovary	Length, Height, Width Calculation: Volume
			Rt. / Lt. Follicles [1~12]	Length Calculation: Volume
		BD	Mass 1 Mass 2 Mass 3	Length, Height, Width, Volume, PSV, EDV, TAPV, PGmean, PGmax, S/D, D/S, RI, PI
		D	Rt. / Lt. Ovarian A	PSV, EDV Calculation: TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Rt. / Lt. Uterine A	PSV, EDV Calculation: TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Pericystic	PSV, EDV Calculation: TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Endometrial	PSV, EDV Calculation: TAPV, PGmean, PGmax, S/D, D/S, RI, PI
		BD	Endo. Polyp	Length, Height, Width, PSV, EDV Calculation: Volume, TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Rt. / Lt. Ovarian Tumor	Length, Height, Width, PSV, EDV Calculation: Volume, TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Uterine Tumor 1 Uterine Tumor 2 Uterine Tumor 3	Length, Height, Width, PSV, EDV Calculation: Volume, TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Cervical Tumor	Length, Height, Width, PSV, EDV Calculation: Volume, TAPV, PGmean, PGmax, S/D, D/S, RI, PI
			Ectopic (Ectopic Pregnancy)	Length, Height, Width, PSV, EDV, Fetal HR Calculation: Volume, TAPV, PGmean, PGmax, S/D, D/S, RI, PI
		N/A	Abnormalities of Uterus	Myometrium Contour Changes Echogenicity Mass
			Environment	Uterus

Function	Description		
			Endometrium
			Myometrium
			Lt. Adnexa, Rt. Adnexa
			Cul de Sac
			Tubes
			Lt. Ovary, Rt. Ovary
			Lt. Kidney, Rt. Kidney
			Lt. Follicles, Rt. Follicles
		Comment	
Carotid Measurement	**Mode**	**Menu Group**	
	N/A	Indication	
	BD	Rt. / Lt. Subclavian A	
		Rt. / Lt. Prox CCA (Proximal CCA)	
		Rt. / Lt. Mid CCA	
		Rt. / Lt. Distal CCA	
		Rt. / Lt. Bulb	
		Rt. / Lt. Prox ICA (Proximal ICA)	
		Rt. / Lt. Mid ICA	
		Rt. / Lt. Distal ICA	
		Rt. / Lt. ECA	
		Rt. / Lt. Vertebral A	
		General	
		Volume Flow	
	N/A	Vertebral	
		A_B	
		ICA/CCA	
		Comment	
Cardiac Measurement	**Mode**	**Menu Group**	
	B	LV	
	M	LV(M)	
	B	LV Vol.(MOD)	
	B	LV Vol.(A/L)	
	B	LV Vol.(Bullet)	
	B	LV Mass	
	B	RV	
	M	RV(M)	
	B	LA Vol.	
	B	Ao / LA	
	B	RA (Rt. Atrium)	
	BD	LVOT	
	BD	RVOT	
	BD	AV(Aortic Valve)	
	M	MV(M)(Mitral Valve)	
	BD	MV(Mitral Valve)	
	BD	TV(Tricuspid Valve)	
	BD	PV(Pulmonic Valve)	

Function	Description	
	D	Tei Index
	D	Pulm. Veins(Pulmonary Veins)
	D	Hepatic Veins
	D	Tissue Doppler
	BD	Qp:Qs(Qpulm:Qsys)
	B	PE(Pericardial Effusion)
	MD	HR
Urology Measurement	**Mode**	**Menu Group**
	B/D	General: Auto Trace, Limited Trace, Manual Trace, PSV, EDV, %StA, %StD, Vesl. Dist., Vesl. Area
	B	Baldder Vol.
	B	WG Prostate Vol. (Whole Gland Prostate Volume)
	B	T-Zone Vol.
	B	Residual Vol.
	B	Lt. Renal Vol.
	B	Rt. Renal Vol.
	N/A	Predicted PSA by WG
	N/A	Prostate Spec. Antigen
	N/A	Predicted PSA by T-Zone
	N/A	Digital Rectal Exam
	N/A	Transcrectal US Prostate
	N/A	Transrectal US Seminal Vesicles
	N/A	Comment
Fetal Echo Measurement	**Mode**	**Menu Group**
	B	2D Echo
	B	CTAR (Cardio-Thorax Area Ratio)
	M	Fetal M-mode
	D	MPA(Main Pulmonary Artery)
	D	Ductus Arteriosus
	D	IVC(Inferior Vena Cava)
	D	Ductus Venosus
	D	Asc Aorta (Ascending Aorta)
	D	Dsc Aorta (Descending Aorta)
	D	MV Inflow
	D	MV Regurg
	D	TV Inflow
	D	TV Regurg
	D	PLI(Preload Index)
	D	Tei Index
	MD	Fetal HR
	N/A	Environment
	N/A	Comment
LE Artery Measurement	**Mode**	**Menu Group**
	BD	Rt. / Lt. CIA (Common Illiac Artery) Rt. / Lt. IIA (Internal Illiac Artery) Rt. / Lt. EIA (External Illiac Artery)

Function	Description	
		Rt. / Lt. CFA (Common Femoral Artery)
		Rt. / Lt. SFA (Superficial Femoral Artery)
		Rt. / Lt. DFA (Deep Femoral Artery)
		Rt. / Lt. POP A (Popliteal Artery)
		Rt. / Lt. ATA (Anterior tibial Artery)
		Rt. / Lt. PTA (Posterior tibital Artery)
		Rt. / Lt. Peroneal A (Peroneal Artery)
		Rt. / Lt. DPA (Dorsalis Pedis Artery)
		Rt. / Lt. MPA (Medial Plantar Artery)
		Rt. / Lt. LPA (Lateral Plantar Artery)
		Rt. / Lt. Metatarsal A (Metatarsal Artery)
		Rt. / Lt. Digital A (Digital Artery)
		General
		Voluem Flow
	MD	HR(Heart Rate)
	N/A	Comment
UE Artery Measurement	**Mode**	**Menu Group**
	BD	Rt./Lt. Subclavian A(Subclavian Artery)
		Rt./Lt. Axillary A(Axillary Artery)
		Rt./Lt. Brachial A(Brachial Artery)
		Rt./Lt. Radial A(Radial Artery)
		Rt./Lt. Ulnar A(Ulnar Artery)
		Rt./Lt. SPA(Superficial Palmar Arches)
		General
		Volume Flow
	MD	HR
	N/A	Comment
LE Vein Measurement	**Mode**	**Menu Group**
	BD	Rt. / Lt. FV (Femoral Vein)
		Rt. / Lt. GSV (Great Saphenous Vein)
		Rt. / Lt. POP V (Popliteal Vein)
		Rt. / Lt. SSV (Small Saphenous Vein)
		Rt. / Lt. MPV (Medial Plantar Vein)
		Rt. / Lt. LPV (Lateral Plantar Vein)
		Rt. / Lt. Metatarsal V (Metatarsal Vein)
		Rt. / Lt. Digital V (Digital Vein)
		General
	N/A	Comment
Radiology Measurement	**Mode**	**Menu Group**
	BD	Aorta
		Celiac A(Celiac Artery)
		Splenic A(Splenic Artery)
		Splenic Vol.(Splenic Volume)
		Hepatic A(Hepatic Artery)
		SMA (Superior Mesenteric Artery)
		IMA (Inferior Mesenteric Artery)

Function	Description	
		IVC(Inferior Vena Cava)
		Rt. / Lt. Renal Vol. (Renal Volume)
		Rt. / Lt. Renal A(Renal Artery)
		Rt. / Lt. Arcuate A(Arcuate Artery)
		General
	MD	HR
	N/A	Indications
		Comment

9 DOCUMENTATION CAPABILITIES

- On-board VCR controls
- On-board printing device control
- Selective printing on two connected printers
- SonoView II
  - » Image Filing Package
  - » Export Media:CD/DVD+R/-R/RW,USB Flash,USB HDD
  - » Exprot Format: JPEG,BMP,TIFF,DICOM
  - » Print Function
  - » Capacity:10BASE-T(Min.4000frame)
  - » Patient list and data search
  - » Report save available
  - » Post image processing available
  - » Caliper measurement available
- 3D View
- DICOM 3.0
  - » Service: Storage,Printer,Workist
- DICOM SR

10 OPTIONAL DEVICES

Device	Description
Video Cassette Recorder (VCR) Analog	Panasonic AG-MD835 SVHS (NTSC & PAL) SONY SVO-9500MD(NTSC & PAL)
Video Cassette Recorder (VCR) Digital	Sony DVO-1000MD
Video Page Printer(BW)	Mitsubishi 0-93WM Monochrome Video Printer Sony Video Graphic Printer UP-897MD
Video Page Printer(Color)	Mitsubishi CP910U color page printer (120V NTSC) Sony up20 Digital Photo Thermal Printer
Inkjet Printer	HP6840 HP6980 HP Pro K550
Laser Printer	HP Color LajerJet3600 HP2420

Device	Description
USB Video Printer(BW)	Sony UP-D897 Mitsubishi P93DW
USB Video PRINTER(Color)	Sony UP-D21MD Mitsubishi CP900DW Sony UP-D23MD
USB MO	3GB External USB Optical Disk Fujitsu 1300U2 Fujitsu 1300U2 Pocket Fujitsu 2300U2
USB MO Mdeia	540M 1.3G 2.3G(Fujitsu 2300U2 only)
USB Flash	Removable Disk
USB to RS232C Converter	FTDI FT232BM Compatible
Foot Switch	The functions of Left &Right Foot Pedals can be selected in Setup Mode. Freeze, Update, Record, Print, Store, 3D, ECG Trigger On/Off

11 PERIPHERAL SIGNALS

Signal	In/Out	Description
S –VHS	O	NTSC/PAL Chrominance: 0.286Vpp/75 ohms/unbalanced Luminance: 1.0Vpp/75 ohms/unbalanced
VHS	O	NTSC/PAL 1.0Vpp/75ohms/unbalanced
Video Patient Monitor	O	Video Signal NTSC/PAL 1.22Vpp/75ohms/unbalanced
Audio R/L	O	1 ports
VGA	O	1 ports
DICOM	I/O	2 ports 10-Base Type
USB port	I/O	6 Ports (front 2, back 4)
Microphone	I	1 port
Patient Monitor Power 9	O	9V / 6W
Printer B/W	O	1.0Vpp/75 ohms/unbalanced
Print Remote	O	Echo printer trigger

12 POWER AND PHYSICAL SPECIFICATIONS

- Power consumption: 900VA
- Heat dissipation: BTU/h, Joules/h
- Probe IPX: 7
- Foot Switch IPX: 1
- Size: 1260mmX 580mmX946mm(HxWxD)
- Weight: 116kg(with monitor)
- 100-120V/60Hz
- 200-240V/60Hz
- Mechanical Index(MI): 0.0~1.9 Range
- Thermal Index(TI): 0.1~5.0 Range

14 OPERATING ENVIRONMENT

- Ambient temperature: 10°C–35°C (50°F–104°F)
- Relative humidity: Up to 75% non-condensing
- Pressure: 700~1060hPa
- Audible noise: 37dB
- Safety class: B or BF

For more information on specification, please contact Product Marketing Team.

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