

SUN-D7 3 in 1 Color Doppler Ultrasound

Wireless Probe Specifications

(128 elements)



General Specifications

Dimensions and weight

Height: 160mm

Width: 70mm

Depth: 30mm

Weight: 220g

Electrical power

Voltage: Battery inside, wireless charge

Device requirements

Windows PC, Notebook, Pad with touch screen (Surface Go is recommended)

Android Pad, Phone

System Overview

Applications

Generic

Abdomen

Obstetrics

Gynecology

Cardiology

Vascular

Small Part

Urology

Musculoskeletal

Operating modes

B Mode

CF Mode (Color Flow Mode)

M Mode

Anatomy M Mode

Color M Mode

PW Doppler

PDI (Power Doppler Imaging)

DPDI (Directional Power Doppler Imaging)

Wide View (Extended Field of View)

NE Mode (Needle Enhance Mode) (option)

Scanning methods

Electronic linear

Electronic convex

Electronic micro-convex

Electronic phased array

Transducer types

Linear array

Phased array

Convex array

Micro convex array

System standard features

Automatic optimization

Spatial compound imaging

Speckle reduction imaging

Color quantification

Fine angle steer

Tissue harmonic imaging (THI), pulse inversion harmonic imaging (iTHI)

Virtual convex

Patient information database

Image archive on integrated hard drive

Real-time automatic Doppler calculations

OB calculations

Fetal trending

Multi-gestational calculations

Hip dysplasia calculations

Gynecological calculations

Vascular calculations

Urological calculations

Renal calculations

Cardiac calculations

On-board electronic documentation

PW Auto-trace

Privacy and security

DICOM

Wide view

Auto IMT

External USB printer connection

Display modes

Live and stored display format: full size and split screen - both w/thumbnails, for still and Cine

Review image format: thumbnails for still and Cine

Time line display: M, PW, AM mode display; side/side selectable format

Simultaneous capability

B/CF

B/PDI or DPDI

B/PW

B/M

B+CF or PDI or DPDI/PW or M

Display annotation

Patient name

Patient ID

Age, sex

OP.No, IP.No

Hospital name

Date format: three types selectable

YYYY-MM-DD/MM-DD-YYYY/DD-MM-YYYY

Time format: 24 hours

Gestational age from

LMP

EDD

Probe name

Displayed acoustic output

MI: Mechanical Index

TIS: Thermal Index Soft Tissue

Probe orientation

Image depth

Zoom depth

B Mode

Imaging frequency

Gain

Image depth

Dynamic range

Frame rate

Speckle reduction

M Mode

Sweep speed

Gain

Dynamic range

Time scale

Doppler Mode

Doppler frequency

Gain

PRF

Wall filter

Dynamic range

Sample volume length

Angle correction

Velocity scale

Time scale

CF Mode

Doppler frequency

Gain

PRF

Wall filter

Color velocity range and baseline

TGC curve

Acoustic frame rate

Body pattern: multiple types

Application name

Measurement results

Operator message

Biopsy guide line and zone

Heart rate

General System Parameters

System setup

Factory default preset data

User programmable preset capability

Languages

User defined annotations

Body patterns

Cine/Image

Cine memory $\geq$ 128 MB

Measurements/calculations and annotations on Cine playback

Scrolling timeline memory

Thumbnails Image/Cine display

Cine review loop

Cine review speed

On-board database of patient information from past exams

Storage formats: DICOM

Export image formats: BMP, JPG, PNG, TIFF, DICOM

Export video formats: WMV, MP4

Storage devices: hard drive image storage, USB memory stick

Report (Only Windows Devices)

On-board reporting package automates report writing

Formats various exam results into a report suitable for printing or reviewing on a standard PC

Exam results include patient info, exam info, measurements, calculations, images, and comments standard templates provided

Customizable templates

Scanning parameters

Continuous dynamic receive focus

Displayed imaging depth: 0 – 30 cm

Minimum depth of field: 0 – 0.5 cm (zoom, probe dependent)

Maximum depth of field: 0 – 30 cm (probe dependent)

Dynamic range $\geq$ 120 dB

Adjustable field of view

Image reverse: Right/left

Image rotation: 0°, 90°, 180°, 270°

B Mode

Adjustable

Gain: 1 - 100%

Frequency

Power: 1 - 100%
Speckle reduction: off, CV1 - CV5/6 steps
Image enhance: off, 1 - 4/5 steps
Dynamic range: 36 - 120db
Focus number: up to 4
Focus gap: 1 - 4/4 steps
Frame averaging: 1 - 8/8 steps
Rejection: 0 - 32/33 steps
TSI (Tissue-specific imaging): 1400 - 1780m/s/20 steps
Line density
View area: 50 - 100%/6 steps
Updown invert
Scan type: normal, compound, trapezoid
Angle
Compound frame
Mirror
Rotation: 0°, 90°, 180°, 270°
Full screen
Gamma: 0.6 - 2.0/15 steps
Palette: 1 -9/9 steps
Color map: 0 - 36/37 steps
Negative
Brightness: -50 - 50%/21 steps
Contrast: -50 - 50%/21 steps

M Mode

Adjustable

Gain: 1 - 100%

Frequency

Power: 1 - 100%

Sweep speed: 1 - 5/5 steps

Dynamic range: 36 - 120db

View area: 50 - 100%/6 steps

Rejection: 0 - 32/33 steps

Right/down

Gamma: 0.6 - 2.0/15 steps

Palette: 1 -9/9 steps

Color map: 0 - 36/37 steps

Negative

Brightness: -50 - 50%/21 steps

Contrast: -50 - 50%/21 steps

Pulsed Wave Doppler Mode

Adjustable

Gain: 1 - 100%

PRF: 0.5 - 21KHz

Power: 1 - 100%

Frequency: 4 steps

Wall filter: 0 - 20/21 steps

Baseline: 0 - 255/52 steps

Sweep speed: 50 - 400/5 steps

Auto-trace

Sample volume length: 0.5 cm - image depth

Steer angle (linear): -20 - 20°/9 steps

Duplex/triplex

High PRF

Fast angle: -60°, 0°, 60°

Angle correction: -89 to 89°/1 degree steps

Right/down

Spectral averaging

Dynamic range: 10 - 60 dB/6 steps

Audio volume: 10 -100/15 steps

Invert

Color map: 1 - 12/12 steps

Negative

Color Flow Mode

Adjustable

Gain: 1 - 100%

CFM size

PRF: 0.5 - 21KHz

Power: 1 - 100%

Frequency: 4 steps

Packet size: 3 - 16/14 steps

B/C align

Color averaging: 1 - 8/8 steps

Wall filter: Related to PRF

Line density: 1 - 4/4 steps

Spatial filter: off, 1-4/5 steps

Steer angle (linear): -20 - 20°/9 steps

High PRF

Baseline: 0 – 255/256 steps

Color invert

Variance

Lighting: 0-2/3 steps

Color threshold: 1 -255/255 steps

Transparency: off, 0 - 255/257 steps

Color priority: 0 - 255/256 steps

Palette: 1 - 12/12 steps

(Directional) Power Doppler Imaging

Adjustable

Gain: 1 - 100%

PRF: 0.5 - 21KHz

Power: 1 - 100%

Frequency: 4 steps

Packet size: 3 - 16/14 steps

B/C align

Color averaging: 1 - 8/8 steps

Wall filter: Related to PRF

Line density: 1 - 4/4 steps

Spatial filter: off, 1-4/5 steps

Steer angle (linear): -20 - 20°/9 steps

High PRF

Baseline (DPDI): 0 – 255/256 steps

Color invert (DPDI)

Variance

Dynamic range: 36 - 120db

Color threshold: 1 -255/255 steps

Transparency: off, 0 - 255/257 steps

Color priority: 0 - 255/256 steps

Palette: 1 - 12/12 steps

Tissue Doppler Imaging

Adjustable

Gain: 1 - 100%

PRF: 0.5 - 21KHz

Power: 1 - 100%

Frequency: 4 steps

Packet size: 3 - 16/14 steps

B/C align

Color averaging: 1 - 8/8 steps

Wall filter: Related to PRF

Line density: 1 - 4/4 steps

Spatial filter: off, 1-4/5 steps

Steer angle (linear): -20 - 20°/9 steps

High PRF

Baseline: 0 – 255/256 steps

Color invert

Variance

Lighting: 0-2/3 steps

Color threshold: 1 -255/255 steps

Transparency: off, 0 - 255/257 steps

Color priority: 0 - 255/256 steps

Palette: 1 - 2/2 steps

Wide View Mode

Extended field of view imaging

For use in B mode

Measurements in B mode

Compound imaging is available

Auto detection of scan direction

Anatomy M Mode

Adjustable

Gain: 1 - 100%

Frequency

Power: 1 - 100%

Angle: -90 - 90°/19 steps

View area: 50 - 100%/6 steps

Sweep speed: 1 - 5/5 steps

Show AM1

Show AM2

Show AM3

Next line

Updown invert

Right/down

Needle Enhance Mode

Adjustable

Gain: 1 - 100%

Frequency

Power: 1 - 100%

Steering: -60 - (-10)°/11 steps

Gamma: 0.6 - 2.0/15 steps

Duplex

Frame averaging: 1 - 8/8 steps

Line density: standard, slight high, high, very high

Rejection: 0 - 254/255 steps

Palette: 1 -9/9 steps

Color map: 0 - 12/13 steps

Brightness: -50 - 50%/21 steps

Contrast: -50 - 50%/21 steps

Time Gain Compensation

Adjustable

TGC1-TGC8

Lateral Gain Compensation

Adjustable

LGC1 - LGC8: -11.95 - 11.95db

Automatic optimization

Optimize image to help improve contrast resolution

Speckle Reduction

Speckle reduction imaging

Provides multiple levels of speckle reduction

Compatible with B mode, contrast and 3D imaging

Compatible with all linear, convex and phase array transducers

Compound Imaging

Provides variable angle spatial compounding

Compatible with most modes

Available on all linear and convex probes

Measurements/Calculations

General B Mode

Stenosis % (diameter, circumference or area)

A/B ratio (length, circumference or area)

Depth and length

Circumference (trace/ellipse)

Area (trace/ellipse)

Volume

Angle between two lines

Histogram

Anatomy

IMT

General M Mode

Stenosis % (distance)

A/B ratio (time interval or velocity)

Time

Distance

Heart rate

Velocity

General Doppler Mode

Trace

Diameter

PS/ED (Peak Systole/End Diastole)

TMean (Time Averaged Mean Velocity)

TMax (Time Averaged Maximum Velocity)

TMin (Time Averaged Minimum Velocity)

PGmax (Maximum Pressure Gradient)

PGmean (Mean Pressure Gradient)

VTI (Velocity-Time Integral)

RI (Resistivity Index)

PI (Pulsatility Index)

HR (Heart Rate)

Point

Velocity

PG (Pressure Gradient)

Distance

Vel.Diff (Velocity Difference)

PG Diff (Pressure Gradient Difference)

Time Interval

Acceleration

RI

Vel Min (Minimum Velocity)

Vel Max (Maximum Velocity)

PS/ED

HR

Volume flow (using diameter or area)

Real-time Doppler auto measurements/calculations

PS (Peak Systole)

ED (End Diastole)

MD (Minimum Diastole)

PI (Pulsatility Index)

RI (Resistivity Index)

HR (Heart Rate)

Abdomen measurements/calculations

Liver volume

Gallbladder

Volume

Wall thickness

EBD (Extrahepatic Bile Duct diameter)

CBD (Common Bile Duct diameter)

CHD (Common Hepatic Duct diameter)

Pancreas

Pancreas Head

Pancreas Body

Pancreas Tail

Pancreas Duct Head

Pancreas Duct Body

Spleen volume

Gastrointestinal Track

Appendix wall

Appendix diameter

Stomach thickness

Small bowel thickness

Large bowel thickness

Bladder volume

Left/right kidney volume

Pelvis measurements

Portal vein diameter

Aorta diameter

Main renal artery measurements

Segment artery measurements

Interlobar artery measurements

Arcuate artery measurements

Renal vein measurements

Abdominal aorta measurements

Celiac axis measurements

Superior mesenteric artery measurements

Common hepatic artery measurements

Proper hepatic artery measurements

Splenic artery measurements

Inferior vena cava measurements

Portal vena measurements

Right/middle/left hepatic vena measurements

Splenic vena measurements

Volume flow

Obstetrics measurements/calculations

Cervix length

NT (Nuchal Translucency) thickness

GS (Gestational Sac)

YS (Yolk Sac)

BPD (Biparietal Diameter)

CRL (Crown-Rump Length)

FL (Femur Length)

AF (Amniotic Fluid)

HC (Head Circumference)

AC (Abdominal Circumference)

HL (Humerus Length)

PL Thickness (Placental Thickness)

Physiology

TAD (Abdominal Transversal Diameter)

APAD (Anteroposterior Abdominal Diameter)

APTD (Anteroposterior Trunk Diameter)

TTD (Transverse Trunk Diameter)

FTA (Fetal Trunk Cross-sectional Area)

THD (Thoracic Diameter)

HrtC (Heart Circumference)

TC (Thoracic Circumference)

Umb VD (Umbilical Vein Diameter)

F-Kidney (Fetal kidney Length)

Skeleton

Clav (Clavicle Length)

Ulna (Ulna Length)

Rad (Radius Length)

Tibia (Tibia Length)

FIB (Fibula Length)

Foot (Foot Length)

LV (Vertebral Length)

Head

OFD (Occipital Frontal Diameter)

TCD (Cerebellum Diameter)

Cist Magna

HW (Hemisphere Width)

OOD (Outer Orbital Diameter)

IOD (Inter Orbital Diameter)

Ear (Ear Length)

LVW (Lateral Ventricle Width)

BOD (Binocular Distance)

Cereb (Cerebellum)

Heart

RV Diam (Right Ventricular Diameter)

RA Diam (Right Atrium Diameter)
RVOT Diam (Right Ventricular Outflow Tract Diameter)
LV Diam (Left Ventricular Diameter)
LA Diam (Left Atrium Diameter)
AO Diam (Aorta Diameter)
MPA Diam (Main Pulmonary Artery Diameter)
IVS (Interventricular Septal Thickness)
APTD (Anteroposterior trunk diameter)
TTD (Transverse Trunk Diameter)
FTA (Fetal Trunk Cross-sectional Area)
THD (Thoracic Diameter)
HrtC (Heart Circumference)
TC (Thoracic Circumference)

FHR (Fetal Heart Rate)

LMP (Last Menstrual Period)

Umbilical artery measurements

Ductus venosus measurements

Ductus arteriosus measurements

Placental artery measurements

Middle cerebral artery measurements

Fetal aorta measurements

Descending aorta measurements

Ovarian artery measurements

Left uterine artery measurements

Right uterine artery measurements

Fetal Count

Gestational age (GA) by

AC (Abdominal Circumference)
ATD(Anteroposterior Trunk Diameter)
BOD (Binocular Distance)
BPD (Biparietal Diameter)
Cereb (Cerebellum)
Clav (Clavicle Length)
CRL (Crown-Rump Length)
FL (Femur Length)
FTA (Fetal Trunk Cross-sectional Area)
GS (Gestational Sac)
HC (Head Circumference)
HL (Humerus Length)
LV (Lateral Ventricle width)
OFD (Occipital Frontal Diameter)
HC/AC
TAPD (Thorax Anterior-Posterior Diameter)
TL (Tibia Length)
TTD (Transverse Trunk Diameter)
Ulna (Ulna Length)

Estimated fetal weight (EFW) by

AC

AC, BPD

FL

AC, FL

AC, HC

AC, FL, HC

AC, BPD, FL

AC, BPD, HC

AC, BPD, FL, HC

BPD, FL, FTA

BPD, ATD

BPD, TTD

BPD, TAPD, TTD

BPD, FL, TAPD, TTD

Estimated delivery date (EDD) by

GA

AUA (Average Ultrasound Age)

LMP (Last Menstrual Period)

Fetal graphical trending

Growth percentiles

Muti-gestational calculations

Fetal qualitative description (anatomical survey)

Fetus Physiological Grading

Programmable OB tables

Over 20 selectable OB calculations

Calculations and ratios

FL/AC

FL/HC

FL/BPD

HC/AC

CI (Cephalic Index)

AFI (Amniotic Fluid Index)

EFW calculations by: Campbell, Hadlock, Jordaan, Warsof, Hsieh, Merz, Shephard, Woo, Tohamy, Ott, Osaka, Eik-Nes and Grottum, Hansmann

GA calculations by: Hadlock, Hansmann, Jeanty, Merz, Tokyo, Campbell, Kurtz, Rempen, Sabbagha, Daya, Nelson, Robinson, Chitty, Hohler, Warda, Hellman, Hollander, Hill, Yarkoni

Gynecology measurements/calculations

Left ovary volume

Right ovary volume

Follicle volume/count

Uterine cervix volume

Uterine volume

Uterine line

Endometrial thickness

Volume flow measurements

Left uterine artery measurements

Right uterine artery measurements

Cardiology measurements/calculations

Measurements:

IVSd (Interventricular Septal Thickness, diastole)

LVIDd (Left Ventricle Internal Diameter, diastole)

LVPWd (Left Ventricle Posterior Wall Thickness, diastole)

IVSs (Interventricular Septal Thickness, systole)
LVIDs (Left Ventricle Internal Diameter, systole)
LVPWs (Left Ventricle Posterior Wall Thickness, systole)
HR (Heart Rate)
LA Diam (Left Atrium Diameter)
AO Diam (Aorta Diameter)
Acs (Aortic Valve Cusp Separation)
RVOT Diam (Right Ventricular Outflow Tract Diameter)
RVDd (Right Ventricular Diameter at end-diastole)
EPSS (Distance between point E and Interventricular Septum when mitral valve is fully open)
LVOT Diam (Left Ventricular Outflow Tract Diameter)
MCS (Mitral Valve Cusp Separation)
MV Diam (Mitral Valve Diameter)
MPA Diam (Main Pulmonary Artery Diameter)
LVOT Diam (Left Ventricular Outflow Tract Diameter)
LVOT HR
PHT (Pressure HalfTime)
MCOT (Mitral Valve Closure to Opening Time)
LV ET (Left Ventricle Ejection time)
RV VTI (Right ventricle Velocity-Time Integral)
TCOT (Tricuspid Valve Closure to Opening Time)
RV ET (Right ventricle Ejection Time)
RVDd (Right Ventricular Diameter at end-diastole)
RVDs (Right Ventricular Diameter at end-systole)
RV AccT (Right Ventricular Acceleration Time)
RV PEP(Right Ventricular Pre-ejection Period)

RV STI (Right Ventricular Systolic Time Interval)

MR (Mitral Value Regurgitation)

AR (Aortic Valve Regurgitation)

AR Vmax (AR Maximum Velocity)

AR Ved (AR Velocity at End-diastole)

AR DcR (AR Deceleration Rate)

AR DcT (AR Deceleration Time)

TR (Tricuspid Valve Regurgitation)

PR (Pulmonary Valve Regurgitation)

PR Vmax (PR Maximum Velocity)

PR PHT (PR Pressure HalfTime)

PR Ved (PR Velocity at End-diastole)

MV (Mitral Valve)

MV Diam (MV Diameter)

MV Area

MV EPSS

MV D-E Slope (The rate of change that exists between two point (D, E))

MV E-F Slope (The rate of change that exists between two point (E, F))

MV CA (Distance between two point (C, A))

MV CE (Distance between two point (C, E))

MV DE (Amplitude of the MV DE wave)

MV ACV (MV Accelerated Velocity)

MV E Vel (MV E-wave Velocity)

MV A Vel (MV A-wave Velocity)

MV PHT

MV Area(PHT)

MV DecT (MV Deceleration Time)

MV IRT (MV Isovolumic Relaxation Time)
MV E Dur (MV E-wave Duration)
MV A Dur (MV A-wave Duration)
MV Sa (MV Systolic motion)
MV Ea (MV Early diastolic motion)
MV Aa (MV Late diastolic motion)
MV IVRT (MV Isovelocity Relaxation Time)
MV IVCT (MV Isovelocity Compression Time)
TV (Tricuspid Valve)
AV (Aortic Valve)
AoV Area
PV (Pulmonary Valve)
PVein (Pulmonary Vein)
PVein S1 Vel (PVein S1-wave Flow Velocity)
PVein S2 Vel (PVein S2-wave Flow Velocity)
PVein A Vel (PVein A-wave Flow Velocity)
PVein D Vel (PVein D-wave Flow Velocity)
PVein A Dur (PVein A-wave Duration)
PVein S VTI (PVein S-wave Velocity-time Integral)
PVein D VTI (PVein D-wave Velocity-time Integral)
PVein DcT (PVein Deceleration Time)

Calculations and ratios:

EDV (End Diastolic Volume)

ESV (End Systolic Volume)

PS/ED

BSA (Body Surface Area)

SV (Stroke Volume)
FS (Fractional Shortening)
SVI (Stroke Volume Index)
EF (Ejection Fraction)
CO (Cardiac Output)
CI (Cardiac Output Index)
MPI (Myocardial Performance Index) (Tei)
dP (Pressure gradient difference):dt (time interval)
LV Mass (Left Ventricle Mass)
LVMI (Left Ventricle Mass Index)
LA (Left Atrium Diameter)/AO (Aortic Root Diameter) %
AccT (Acceleration Time)/ET (Ejection Time)
PVein S2/D
Qp (Pulmonary circulation flow)
Qs (Systemic circulation flow)
Ratio Qp/Qs
Simpson SP
Simpson DP

EDV / ESV calculations by:

SP Ellipse
BiPlane Ellipse
Bullet
Simpson
Cube
Teichholz
Gibson

Vascular measurements/calculations

CCA (Common Carotid Artery)

ICA (Internal Carotid Artery)

ECA (External Carotid Artery)

Arteria Carotis

UEA (Upper Extremity Artery)

UE V (Upper Extremity Vein)

LEA (Lower Extremity Artery)

LE V (Lower Extremity Vein)

IMT (Intima-Media Thickness)

CCA IMT

Bulbulate IMT

ICA IMT

ECA IMT

Volume flow

Vessel

Vessel Diameter

Vessel Area

Vessel PS/ED

Vessel HR

Vessel AccT (Vessel Acceleration Time)

Vessel DecT (Vessel Deceleration Time)

Vessel CycleT (Vessel Cycle Time)

Small part measurements/calculations

Thyroid volume

Left thyroid lobe volume

Right thyroid lobe volume

Isthmus height

Galactophore volume

Mass volume

Testis measurements

Superior thyroid artery measurements

Inferior thyroid artery measurements

Urology measurements/calculations

Left kidney volume

Right kidney volume

Bladder volume

Residual urine volume

Prostate volume

PSAD (Prostate Specific Antigen Density) calculations

Testis measurements

Musculoskeletal measurements/calculations

Hip angles

BL (Baseline)

RL (Roof line)

IL (Inclination line)

α

β

Methods: Graf

FHC (Femoral Head Coverage) %

d (distance from the baseline to the medial aspect of the femoral head)

D (maximum diameter of the femoral head)

Measurements/calculations software packages

Generic (Windows/Android Devices)

Abdomen (Only Windows Devices)

Obstetrics (Only Windows Devices)

Gynecology (Only Windows Devices)

Cardiology (Only Windows Devices)

Vascular (Only Windows Devices)

Small Part (Only Windows Devices)

Urology (Only Windows Devices)

Musculoskeletal (Only Windows Devices)

