LOGIQ™ E10

Data sheet

The LOGIQ E10 is GE's leadership ultrasound imaging system designed for abdominal, vascular, obstetric, gynecologic, neonatal, pediatric, urological, transcranial, cardiac and small parts applications.

gehealthcare.com

General specifications

Dimensions and weight *(Dimensions given with floating keyboard stowed and display tilted for transport)*	
Height	1300 mm, (51")
Width	585 mm, (23")
Depth	900.9 mm, (35.5")
Weight	126 kg, (278 lbs)

Electrical power
Voltage 100 – 240 VAC
Frequency 50/60 Hz
Power Consumption maximum of 0.9 KVA with peripherals

Console design
4 active probe ports
2 inactive probe storage ports
Integrated HDD (1 TB) and SSD (128 GB)
Integrated DVD-R Multi Drive
On-board storage of thermal printer
Integrated speakers with sub-woofer for premium sound
Integrated locking mechanism that provides rolling lock and caster swivel lock
Integrated cable management
Front and rear handles
Easily removable air filters

User interface

Operator keyboard	
Floating keyboard adjustable in three dimensions	• Height • Rotation • Extension
Full-sized, backlit alphanumeric keyboard	
Ergonomic hard key layout	
Interactive back-lighting	
Integrated recording keys for remote control of up to 4 peripheral or DICOM® devices	
Integrated gel warmer (Option)	

Touch screen
12.1" High-resolution, color, touch, display screen
Interactive dynamic software menu
Brightness adjustment
User-configurable layout

Display monitor
22" Wide screen high-resolution OLED display
Display translation (independent of console)
350 mm, (13.7") horizontal (both directions)
150 mm, (5.9") vertical
90° swivel (both directions)
Fold-down and lock mechanism for transportation
Resolution: 1920 X 1080
Anti-glare
Viewing angle 89/89/89°

System overview

Applications
Abdominal
Obstetrical
Gynecological
Breast
Small Parts
Peripheral Vascular
Transcranial (adult and neonatal)
Pediatric and neonatal
Musculoskeletal (general and superficial)
Urological
Cardiac (adult and pediatric)

Operating modes
B-Mode
M-Mode
Color Flow Mode (CFM)
B-Flow™

System overview *(cont.)*

Operating modes *(cont.)*

Extended field of view (LOGIQView)	
Power Doppler Imaging (PDI)	
PW Doppler	
CW Doppler (Option)	
Volume Modes (3D/4D) (Option)	• 3D Static • 4D Real Time
Anatomical M-Mode	
Coded Contrast Imaging (Option)	
Strain elastography	
Shear wave elastography (Option)	

Scanning methods

- Electronic sector
- Electronic convex
- Electronic linear
- Mechanical volume sweep

Transducer types

- Sector phased array
- Convex array
- Micro convex array
- Linear array
- Matrix array
- Volume probes (4D)
- Convex array
- Split crystal

System standard features

- Advanced user interface with high-resolution 12.1" display touch panel
- Automatic optimization
- CrossXBeam™
- Speckle Reduction Imaging (SRI-HD)
- Fine angle steer
- Coded harmonic imaging
- Virtual convex
- Patient information database

System standard features *(cont.)*

- Image archive on integrated CD/DVD and hard drive
- Advanced 3D
- Raw data analysis
- Real-time automatic Doppler calculations
- OB calculations
- Fetal trending
- Multigestational calculations
- Hip dysplasia calculations
- Gynecological calculations
- Vascular calculations
- Urological calculations
- Renal calculations
- Cardiac calculations
- InSite™ capability
- On-board electronic documentation
- Tricefy®
- Auto CF/PW positioning feature
- Privacy and security, including user and rights management
- DICOM
- B-Flow
- LOGIQView
- Compare Assistant
- Scan Assistant
- Auto IMT
- Breast productivity package
- Thyroid productivity package
- OB measure assistant
- Color quantification
- Strain elastography
- External USB printer connection
- HDMI output available for compatible devices

Options

- Advanced privacy and security (vulnerability scan)
- Power assistant
- Storage bins

System overview *(cont.)*

Peripheral options	
Integrated options for	• Digital B&W thermal printer • DVD video recorder
Digital color thermal printer	
Digital A6 color thermal printer	
Foot switch, with programmable functionality	
Console protective cover	
LOGIQ smart device apps	• Photo Assistant • Remote Control

Display modes	
Live and stored display format	• Full size and split screen – both w/ thumbnails. For still and CINE
Review image format	• 4x4, and thumbnails. For still and CINE
Time line display	• Independent Dual B or CrossXBeam/PW Display • CW • Display formats top/bottom selectable format • Side/side selectable format
Virtual convex	

Simultaneous capability
B or CrossXBeam/PW
B or CrossXBeam/CW (Option)
B or CrossXBeam/CFM or PDI
B/M
B/CrossXBeam
B-Flow/PW
Real-time Triplex Mode
(B or CrossXBeam + CFM or PDI/PW)

Selectable alternating modes
B or CrossXBeam/PW
B or CrossXBeam + CFM (PDI)/PW
B/CW (Option)

Multi-image (split/quad screen)
Live and/or frozen
B or CrossXBeam + B or CrossXBeam/CFM or PDI
PW/M
Independent Cine playback

Display annotation	
Patient name: first, last and middle	
Patient ID	
Alternate patient ID	
Age, sex and date of birth	
Hospital name	
Date format: three types selectable	• MM/DD/YY • DD/MM/YY • YY/MM/DD
Time format: two types selectable	• 24 hours • 12 hours
Gestational age from	• LMP • GA • EDD • BBT
Probe name	
Map names	
Probe orientation	
Depth scale marker	
Lateral scale marker	
Image depth	
Zoom depth	
B-Mode	• Gain • Dynamic range • Imaging frequency • Frame averaging • Gray map • SRI-HD
M-Mode	• Gain • Dynamic range • Time scale

System overview *(cont.)*

Display annotation *(cont.)*	
Doppler Mode	• Gain • Angle • Sample volume depth and width • Wall filter • Velocity and/or frequency scale • Spectrum inversion • Time scale • PRF • Doppler frequency
Color Flow Doppler Mode	• Line density • Frame averaging • Color Scale: 3 types: power, directional PDI, and symmetrical velocity imaging • Color velocity range and baseline • Color threshold marker • Color gain • PDI • Spectrum inversion • Doppler frequency
TGC curve	
Acoustic frame rate	
CINE gage, image number/frame number	
Body pattern: multiple human and animal types	
Application name	
Measurement results	
Operator message	
Displayed acoustic output	• TIS: Thermal Index Soft Tissue • TIC: Thermal Index Cranial (Bone) • TIB: Thermal Index Bone • MI: Mechanical Index
% of maximum power output	
Biopsy guide line and zone	
Heart rate	

General system parameters

System setup
Pre-programmed categories
User programmable preset capability
Factory default preset data

System setup *(cont.)*
Languages: English, French, German, Spanish, Italian, Brazilian Portuguese, Russian, Greek, Swedish, Danish, Dutch, Finnish, Norwegian
OB Report Formats including Tokyo
Univ., Osaka Univ., USA, Europe and ASUM
User defined annotations
Body patterns
Customized comment home position

Complete user manual available on board through Help (F1)
User manual and service manual are included on USB with each system. A printed manual is available upon request.

CINE memory/image memory
1 GB of CINE memory
Selectable CINE sequence for CINE review
Prospective CINE mark
Measurements/calculations and annotations on CINE playback
Scrolling timeline memory
Dual Image CINE display
Quad Image CINE display
CINE gauge and CINE image number display
CINE review loop
CINE review speed

Image storage	
On-board database of patient information from past exams	
Storage formats: DICOM	• Compressed/uncompressed • Single/multi-frame • Enhanced (3D/4D) • With/without raw data
Export JPEG, JPEG 2000, WMV (MPEG 4) formats	
Storage devices	• USB memory stick: 64 MB to 64 GB (for exporting individual images/clips) • CD-R storage: 700 MB • DVD storage: -R (4.7 GB) • Hard drive image storage: ~830GB
Compare previous exam images with current exam	
Reload of archived data sets	

General system parameters *(cont.)*

Connectivity

Ethernet network connection

Wireless LAN 802.11ac/a/b/g/n (Option)

DICOM 3.0	• Verify • Print • Store • Modality worklist • Storage commitment • Modality performed procedure step (MPPS) • Media exchange • Off network/mobile storage queue • Query/retrieve

Public SR template

Structured Reporting – compatible with vascular and OB, cardiac and breast standard

InSite capability

Advanced privacy and security (Option)

Physiological input panel (Option)

Physiological input	• ECG, 1 channel • PCG, 1 channel • AUX, 1 channel • Dual R-Trigger • Pre-settable ECG R delay time • Pre-settable ECG position • Adjustable ECG gain control • Pre-settable PCG position • Adjustable PCG gain control • Pre-settable AUX position • Adjustable AUX gain control

Automatic heart rate display

Auto Ejection Fraction

Report writer (Option)

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

Displayed imaging depth: 0 – 50 cm

Minimum depth of field: 0 – 2 cm (zoom) (probe dependent)

Maximum depth of field: 0 – 50 cm (probe dependent)

Continuous dynamic receive focus/continuous dynamic receive

Aperture

Adjustable dynamic range	Adjustable field of view (FOV)

Image reverse: right/left

Image rotation of 0°, 180°

Digital B-Mode

Adjustable	• Acoustic power • Gain • Dynamic range • Frame averaging • Gray scale map • Frequency • Speed of sound (application dependent) • Framerate • Scanning size (FOV or Angle – Depending on the probe, see probe specifications) • CrossXBeam • B colorization • Reject • Suppression • SRI-HD

Digital M-Mode

Adjustable	• Acoustic power • Gain • Dynamic range • Gray scale map • Frequency • Sweep speed • M colorization • M display format • Rejection

Anatomical M-Mode

M-mode cursor adjustable at any plane

Can be activated from a CINE loop from a live or stored image

M & A capability

Available with Color Flow Mode

General system parameters *(cont.)*

Digital Spectral Doppler Mode

Adjustable	• Acoustic power • Gain • Dynamic range • Gray scale map • Transmit frequency • Wall filter • PW colorization • Velocity scale range • Sweep speed • Sample volume length • Angle correction • Steered linear • Spectrum inversion • Trace method • Baseline shift • Doppler auto trace • Time resolution • Compression • Trace direction • Trace sensitivity

Digital Color Flow Mode

Adjustable	• Acoustic power • Color maps, including velocity-variance maps • Gain • Velocity scale range • Wall filter • Packet size • Line density • Spatial filter • Steering angle • Baseline shift • Frame average • Threshold • Accumulation mode • Flash suppression • Auto ROI placement and steering on linear • Shortcuts

Digital Power Doppler Imaging

Adjustable	• Acoustic power • Color maps, including velocity-variance maps • Gain • Velocity scale range • Wall filter • Packet size • Line density • Spatial filter • Steering angle • Frame average • Threshold • Accumulation mode • Flash suppression • Shortcuts

Continuous Wave Doppler (Option)

Available on M5Sc-D, 6Tc-RS, and P2D probes

Steerable CW mode included

Adjustable	• Acoustic power • Gain • Dynamic range • Gray scale map • Transmit frequency • Wall filter • CW colorization • Velocity scale range • Sweep speed • Angle correction • Spectrum inversion • Trace method • Baseline shift • Doppler auto trace • Compression • Trace direction • Trace sensitivity

Automatic optimization

Optimize B-Mode image to help improve contrast resolution

Selectable amount of contrast resolution improvement (low, medium, high)

Auto-spectral optimize – adjusts baseline, invert, PRF (on live image), and angle correction

Auto CF and PW positioning – adjusts ROI position, sample volume position and steering

Coded Harmonic Imaging

Available on all 2D and 4D probes

B-Flow

Available on C1-6-D, C1-6VN-D, C2-7-D, C2-7VN-D, C2-7-D-LC, C2-9-D, C2-9VN-D, C3-10-D, L2-9-D, L2-9VN-D, ML6-15-D, M5Sc-D and L8-18i-D probes

Background

Sensitivity/PRI

Acoustic power

Frequency

Line density

Frame average

Gray scale map

Tint map

Dynamic range

General system parameters *(cont.)*

B-Flow *(cont.)*
Rejection
Gain
Suppression
SRI-HD
Accumulation

B Steer+
Available on the following probes: L2-9-D, ML6-15-D, L8-18i-D

Coded contrast imaging (Option)
Available on C1-6-D, C1-6VN-D, C2-9-D, C2-9VN-D, C2-7-D, C2-7VN-D, C2-7-D-LC, C3-10-D, IC5-9-D, L2-9-D, L2-9VN-D, ML6-15-D, RAB6-D, RIC5-9-D, M5Sc-D
2 contrast timers
Timed updates: 0.05 – 10 seconds
Accumulation mode, seven levels
Maximum enhance mode
Flash
Time intensity curve (TIC) analysis
Parametric imaging
The LOGIQ E10 is designed for compatibility with most commercially available ultrasound contrast agents. Because the availability of these agents is subject to government regulation and approval, product features intended for use with these agents may not be commercially marketed nor made available before the contrast agent is cleared for use. Contrast related product features are enabled only on systems for delivery to an authorized country or region of use.

LOGIQView
Extended field of view Imaging
Up to 160 cm (63") scan length
Available on all 2D imaging probes
For use in B-Mode
CrossXBeam is available on linear probes
Auto detection of scan direction
Pre-or post-process zoom
Rotation
Auto best fit on monitor
Measurements in B-Mode

3D
Allows unlimited rotation and planar translations
3D reconstruction from CINE sweep

Advanced 3D
Acquisition of color data
Automatic rendering
3D landscape technology
3D movie

Real Time 4D (Option)	
Acquisition modes	• Real Time 4D • Static 3D • Spatio-Temporal Image Correlation
Visualization modes	• 3D rendering (diverse surface and intensity projection modes) • Sectional planes (3 section planes perpendicular to each other) • Omniview • Volume contrast imaging-static • Volume contrast imaging – Omniview • Tomographic ultrasound imaging
Render mode	• Surface texture, surface smooth, max-, min- and X-ray (average intensity projection), mix mode of two render modes • HD*live*™
Curved 3-point render start	
3D movie	
Scalpel: 3D cut tool	
Display format	• Quad: A-/B-/C-Plane/3D • Dual: A-Plane/3D • Single: 3D or A- or B- or C-Plane
Automated volume calculation – VOCAL II	
Betaview	

General system parameters *(cont.)*

Volume navigation (Option)

Available on the C1-6VN-D, C2-9VN-D, C2-7VN-D, C3-10-D, L2-9VN-D, M5Sc-D, ML6-15-D, IC5-9-D, and L8-18i-D probes

Sensor-based acquisition

Position markers

Needle tip tracking

Virtual tracking

Auto image registration

Tru3D feature includes	Display of data in: main-, parallel-, angular-mode

Render modes: gray surface, texture, min-, max-, average-intensity

Measurements: distance, angle, area, volume

3D movie

Scan assistant

Factory programs

User-defined programs

Steps include image annotations, mode transitions, basic imaging controls and measurement initiation

Compare assistant

Allows side-by-side comparison of previous ultrasound and other modality exams during live scanning

Breast productivity package

Auto measurement

Worksheet summary includes measurements and locations for lesions and lymph nodes

Feature assessment

BI-RADS™ assessment

User editable

Thyroid productivity package

Auto measurement

Worksheet summary includes measurements and locations for nodule, parathyroid and lymph node

Feature assessment

User editable

Shear Wave Elastography (Option)

Available on C1-6-D, C1-6VN-D, L2-9-D and L2-9VN-D transducers

User programmable measurement display in kPa and meters per second

Single and dual view display

Strain elastography

Available on ML6-15-D, L2-9-D, L2-9VN-D, IC5-9-D, C2-9-D, C2-9VN-D, C1-6-D, and C1-6VN-D probes

Relative analysis tool

Quantitative flow analysis

Available in color and power Doppler

TVI (Option)

Myocardial Doppler imaging with color overlay on tissue image

Available on M5Sc-D and 6Tc-RS transducers

Tissue color overlay can be removed to show just the 2D image, still retaining the tissue velocity information

Curved anatomical M-Mode: free (curved) drawing of M-Mode generated from the cursor independent from the axial plane

Q-Analysis: multiple time-motion trace display from selected points in the myocardium

Stress echo (Option)

Advanced and flexible stress echo examination capabilities

Provides exercise and pharmacological protocol templates

6 default templates

Template editor for user configuration of existing templates or creation of new templates

Reference scan display during acquisition for stress level comparison (dual screen)

Baseline level/previous level selectable

Raw data continuous capture

Over 100 sec. available

Wall motion scoring (bulls-eye and segmental)

Smart stress: Automatically set up various scanning parameters (e.g. geometry, frequency, gain) according to same projection on previous level

General system parameters *(cont.)*

Auto EF

Allows semi-automatic measurement of the global EF (Ejection Fraction)

User editable

Cardiac AFI (Option)

Allows assessment of the complete left ventricle with all segments at a glance by combining three longitudinal views into one comprehensive bulls-eye view

2D strain based data moves into clinical practice

Virtual convex

Provides a convex field of view

Compatible with CrossXBeam

Available on all linear and sector transducers

SRI-HD

Speckle reduction imaging

Provides multiple levels of speckle reduction

Compatible with side-by-side DualView display

Compatible with all linear, convex and sector transducers

Compatible w/ B-Mode, color, contrast agent and 3D/4D imaging

CrossXBeam

Provides variable angle spatial compounding

Live side-by-side DualView display

Compatible with	• Color mode • PW • SRI-HD • Coded harmonic imaging • Virtual convex

Available on all curved and linear probes

Controls available while "live"

Write zoom

B/M/CrossXBeam-Mode	• Gain • TGC • Dynamic range • Acoustic output • Framerate control • Sweep speed for M-Mode • CrossXBeam angle

Controls available while "live" *(cont.)*

PW-Mode	• Gain • Dynamic range • Acoustic output • Transmission frequency • PRF • Wall filter • Spectral averaging • Sample volume gate: length, depth • Velocity scale
Color Flow Mode	• CFM gain • CFM velocity range • Acoustic output • Wall echo filter • Packet size • Frame rate control • CFM spatial filter • CFM frame averaging • CFM line resolution • Frequency/velocity baseline shift

Controls available on "freeze" or recall

Automatic optimization

SRI-HD

CrossXBeam – display non-compounded and compounded image simultaneously in split screen

3D reconstruction from a stored CINE loop

B/M/CrossXBeam mode	• Gray map optimization • TGC • Colorized B and M • Frame average (loops only) • Dynamic range

Anatomical M-Mode

Max Read Zoom to 8x

Baseline shift

Sweep speed

PW mode	• Gray map • Post gain • Baseline shift • Sweep speed • Invert spectral wave form • Compression • Rejection • Colorized spectrum • Display format • Doppler audio • Angle correct • Quick angle correct • Auto angle correct

General system parameters *(cont.)*

Controls available on "freeze" or recall *(cont.)*	
Color flow	• Overall gain (loops and stills) • Color map • Transparency map • Frame averaging (loops only) • Flash suppression • CFM display threshold • Spectral invert for color/Doppler
Anatomical M-Mode on cine loop	
4D	• Gray map, colorize • Post gain • Change display – single, dual, quad sectional or rendered

Measurements/calculations

General B-Mode
Depth and distance
Circumference (ellipse/trace)
Area (ellipse/trace)
Volume (ellipsoid)
% Stenosis (area or diameter)
Angle between two lines
Dual B-Mode capability

General M-Mode
M-Depth
Distance
Time
Slope
Heart rate

General Doppler measurements/calculations
Velocity
Time
A/B ratio (velocities/frequency ratio)
PS (Peak Systole)
ED (End Diastole)
PS/ED (PS/ED Ratio)

General Doppler measurements/calculations *(cont.)*
ED/PS (ED/PS Ratio)
AT (Acceleration Time)
ACCEL (Acceleration)
TAMAX (Time Averaged Maximum Velocity)
Volume flow (TAMEAN and vessel area)
Heart rate
PI (Pulsatility Index)
RI (Resistivity Index)

Real-time Doppler auto measurements/calculations
PS (Peak Systole)
ED (End Diastole)
MD (Minimum Diastole)
PI (Pulsatility Index)
RI (Resistivity Index)
AT (Acceleration Time)
ACC (Acceleration)
PS/ED (PS/ED Ratio)
ED/PS (ED/PS Ratio)
HR (Heart Rate)
TAMAX (Time Averaged Maximum Velocity)
PVAL (Peak Velocity Value)
Volume Flow (TAMEAN and Vessel Area)

OB measurements/calculations	
Gestational age by	• GS (Gestational Sac) • CRL (Crown Rump Length) • FL (Femur Length) • BPD (Biparietal Diameter) • AC (Abdominal Circumference) • HC (Head Circumference) • APTD x TTD (Anterior/ Posterior Trunk Diameter by Transverse Trunk Diameter) • FTA (Fetal Trunk Cross-sectional Area) • HL (Humerus Length) • BD (Binocular Distance) • FT (Foot Length) • OFD (Occipital Frontal Diameter) • TAD (Transverse Abdominal Diameter)

Measurements/calculations *(cont.)*

OB measurements/calculations *(cont.)*

Gestational age by *(cont.)*	• TCD (Transverse Cerebellum Diameter) • THD (Thorax Transverse Diameter) • TIB (Tibia Length) • ULNA (Ulna Length) • OOD (Outer Orbital Diameter) • IOD (Inner Orbital Diameter) • FIB (Fibula length) • Radius (Radius length) • LV (Lateral Ventricle width) (= SL)

Fetal graphical trending

Growth percentiles

Multi-gestational calculations (4)

Fetal qualitative description (anatomical survey)

Fetal environmental description (biophysical profile)

Programmable OB tables

Over 20 selectable OB calculations

Expanded worksheets

Estimated fetal weight (EFW) by:

AC, BPD

AC, BPD, FL

AC, BPD, FL, HC

AC, FL

AC, FL, HC

AC, HC

BPD, APTD, TTD, FL

BPD, APTD, TTD, SL

Calculations and ratios

FL/BPD

FL/AC

FL/HC

HC/AC

CI (Cephalic Index)

AFI (Amniotic Fluid Index)

CTAR (Cardio-Thoracic Area Ratio)

Calculations and ratios *(cont.)*

Measurements/calculations by: Alexander, ASUM, ASUM 2001, Bahlmann, Baschat, Berkowitz, Bertagnoli, Brenner, Campbell, CFEF, Chervenak, Chitty, Doubilet, Ebing, Eik-Nes Goldstein, Hadlock, Hansmann, Hellman, Hill, Hohler, Jeanty, JSUM, Kurmanavicius, Kurtz, Mari, Mayden, Mercer, Merz, Moore, Nelson, Osaka University, Paris, Pexsters, Rempen, Robinson, Shepard, Shepard/Warsoff, Sonek, Tokyo University, Tokyo/Shinozuka, WHO, Yarkoni

OB measure assistant

Allows automatic measurement of BPD, HC, FL and AC

User editable

GYN measurements/calculations

Right ovary length, width, height

Left ovary length, width, height

Uterus length, width, height

Cervix length, trace

Ovarian volume

ENDO (Endometrial thickness)

Ovarian RI

Uterine RI

Follicular measurements

Fibroid measurements

Pelvic floor measurements

Summary reports

Qualitative description (anatomical survey)

Vascular measurements/calculations

SYS DCCA (Systolic Distal Common Carotid Artery)

DIAS DCCA (Diastolic Distal Common Carotid Artery)

SYS MCCA (Systolic Mid Common Carotid Artery)

DIAS MCCA (Diastolic Mid Common Carotid Artery)

SYS PCCA (Systolic Proximal Common Carotid Artery)

DIAS PCCA (Diastolic Proximal Common Carotid Artery)

SYS DICA (Systolic Distal Internal Carotid Artery)

DIAS DICA (Systolic Distal Internal Carotid Artery)

SYS MICA (Systolic Mid Internal Carotid Artery)

DIAS MICA (Diastolic Mid Internal Carotid Artery)

SYS PICA (Systolic Proximal Internal Carotid Artery)

Measurements/calculations *(cont.)*

Vascular measurements/calculations *(cont.)*
DIAS PICA (Diastolic Proximal Internal Carotid Artery)
SYS DECA (Systolic Distal External Carotid Artery)
DIAS DECA (Diastolic Distal External Carotid Artery)
SYS PECA (Systolic Proximal External Carotid Artery)
DIAS PECA (Diastolic Proximal External Carotid Artery)
VERT (Systolic Vertebral Velocity)
SUBCLAV (Systolic Subclavian Velocity)
Automatic IMT
Summary reports

Urological calculations
Bladder volume
Prostate volume
Left/right renal volume
Generic volume
Post-void bladder volume
Pelvic floor measurements

Probes *(All Optional)*

C1-6-D, XDclear™ convex probe
Applications: abdomen, OB/GYN, pediatric, peripheral vascular, general musculoskeletal
Biopsy guide: multi-angle, disposable with a reusable bracket (H4917VB)

C1-6VN-D, VNav inside XDclear convex probe
VNav sensor inside transducer for Volume Navigation tracking without sensor cables
Applications: abdomen, OB/GYN, pediatric, peripheral vascular, general musculoskeletal
Biopsy guide: multi-angle, disposable with a reusable bracket (H4917VB)

C2-9-D, XDclear convex probe
Applications: abdomen, OB/GYN, pediatric, peripheral vascular, neonatal, neonatal transcranial, general musculoskeletal
Biopsy guide: multi-angle, disposable with a reusable bracket (H4913BA)

C2-9VN-D, VNav inside XDclear convex probe
VNav sensor inside transducer for Volume Navigation tracking without sensor cables
Applications: abdomen, OB/GYN, pediatric, peripheral vascular, neonatal, neonatal transcranial, general musculoskeletal
Biopsy guide: multi-angle, disposable with a reusable bracket (H4913BA)

C2-7-D, micro convex biopsy probe
Applications: abdomen, pediatric
Biopsy guide: multi-angle, disposable with a reusable bracket (H40482LK), Multi-Angle, reusable stainless bracket (H40482LL)

C2-7VN-D, VNav inside micro convex biopsy probe
VNav sensor inside transducer for Volume Navigation tracking without sensor cables
Applications: abdomen, pediatric
Biopsy guide: multi-angle, disposable with a reusable bracket (H40482LK), Multi-Angle, reusable stainless bracket (H40482LL)

C3-10-D, XDclear micro convex probe
Applications: neonatal, pediatric, peripheral vascular, neonatal transcranial, small parts

IC5-9-D, micro convex probe
Applications: OB/GYN, urology
Biopsy guide: single angle, disposable with a disposable bracket (E8385MJ) or reusable bracket (H40412LN)

M5Sc-D, XDclear sector probe
Applications: adult cardiac, pediatric cardiac, adult cephalic, abdominal
Biopsy guide: multi-angle, disposable with a reusable bracket (H45561FC)

L2-9-D, XDclear linear probe
Applications: peripheral vascular, small parts, pediatric, abdomen, OB/GYN, general musculoskeletal, superficial musculoskeletal, neonatal, neonatal transcranial
Biopsy guide: multi-angle, disposable with a reusable bracket (H44901AM)

Probes *(cont.)*

L2-9VN-D, VNav inside XDclear linear probe

VNav sensor inside transducer for Volume Navigation tracking without sensor cables

Applications: peripheral vascular, small parts, pediatric, abdomen, OB/GYN, general musculoskeletal, superficial musculoskeletal, neonatal, neonatal transcranial

Biopsy guide: multi-angle, disposable with a reusable bracket (H44901AM)

ML6-15-D, matrix array linear probe

Applications: small parts, peripheral vascular, neonatal, pediatric, neonatal transcranial, general musculoskeletal, superficial musculoskeletal

Biopsy guide: multi-angle, disposable with a reusable bracket (H40432LJ)

L8-18i-D, linear probe

Applications: small parts, peripheral vascular, neonatal, neonatal transcranial, general musculoskeletal, superficial musculoskeletal, intraoperative

RAB6-D, convex volume probe

Applications: abdomen, OB/GYN, pediatric, neonatal

Biopsy guide: single angle, reusable bracket (H46701AE)

RIC5-9-D, convex volume probe

Applications: OB/GYN, urology

Biopsy guide: single angle, reusable (H46721R)

P2D, CW split crystal probe

Applications: adult cardiac, pediatric cardiac, peripheral vascular, adult cephalic

6Tc-RS, trans-esophageal probe

Applications: adult cardiac

External Inputs and outputs (not including on-board peripherals)

HDMI

Ethernet

Multiple USB 3.0 ports

Safety conformance

The LOGIQ E10 is:

Classified to UL 60601-1 by a Nationally Recognized Test Lab

Certified to CAN/CSA-C22.2 No. 601.1-M90 by an SCC accredited test lab

CE Marked to Council Directive 93/42/EEC on medical devices

Compliant to Council Directive 2011/65/EU for RoHS

Conforms to the following standards for safety (including national deviations)	• IEC 60601-1 Medical electrical equipment – Part 1: General requirements for safety • IEC 60601-1-2 Medical electrical equipment – Part 1-2 General requirements for safety – Collateral Standard: Electromagnetic compatibility – requirements and tests • IEC 62366 Medical Devices – Application of Usability Engineering to Medical Devices • IEC 62304 Medical device software – Software life-cycle processes • IEC 60601-2-37 Medical electrical equipment – Part 2-37: Particular requirements for the safety of ultrasonic medical diagnostic and monitoring equipment • ISO 10993-1 Biological evaluation of medical devices – Part 1 Evaluation and testing (probe and biopsy brackets) • NEMA UD2 Acoustic output measurement standard for diagnostic ultrasound equipment • NEMA UD3 Standard for real time display of thermal and mechanical acoustic output indices on diagnostic ultrasound equipment (MI, TIS, TIB, TIC) • EMC Emissions Group 1 Class A device requirements as per Sub clause 4.2 of CISPR 11

Supplement: cardiac measurements/calculations

B-Mode measurements	
Aorta	• Aortic Root Diameter (Ao Root Diam) • Aortic Arch Diameter (Ao Arch Diam) • Ascending Aortic diameter (Ao Asc) • Descending Aortic Diameter (Ao Desc Diam) • Aorta Isthmus (Ao Isthmus) • Aorta (Ao st junct)
Aortic valve	• Aortic Valve Cusp Separation (AV Cusp) • Aortic Valve Area Planimetry (AVA Planimetry) • (Trans AVA)
Left atrium	• Left Atrium Diameter (LA Diam) • LA Length (LA Major) • LA Width (LA Minor) • Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao ratio) • Left Atrium Area (LAA(d), LAA(s)) • Left Atrium Volume, Single Plane, Method of Disk (LAEDV A2C, LAESV A2C) (LAEDV A4C, LAESV A4C), (LAEDV A-L, LAEDV Index A-L, LAESV A-L, LAESV Index A-L)
Left ventricle	• Left Ventricle Mass (LVPWd, LVPWs) • Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) Left Ventricle Length (LVLd, LVLs) • Left Ventricle Outflow Tract Diameter (LVOT Diam) • Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs) • Left Ventricle Length (LV Major) • Left Ventricle Width (LV Minor) • Left Ventricle Outflow Tract Area (LVOT) • Left Ventricle Area, Two Chamber/Four Chamber/Short Axis (LVA (d), LVA (s)) • Left Ventricle Endocardial Area, Width (LVA (d), LVA(s)) • Left Ventricle Epicardial Area, Length (LVAepi (d), LVAepi (s)) • Left Ventricle Mass Index (LVPWd, LVPWs) • Ejection Fraction, Teichholz/Cube (LVIDd, LVIDs) • Left Ventricle Posterior Wall Fractional Shortening (LVPWd, LVPWs) • Left Ventricle Stroke Index, Teichholz/Cube (LVIDd, LVIDs and Body Surface Area) • Left Ventricle Fractional Shortening (LVIDd, LVIDs) • Left Ventricle Stroke Volume, Teichholz/Cubic (LVIDd, LVIDs) • Left Ventricle Stroke Index, Single Plane, Two Chamber, Method of Disk (LVI Dd, LVIDs, LVSd, LVSs)

B-Mode measurements *(cont.)*	
Left ventricle *(cont.)*	• Left Ventricle Stroke Index, Single Plane, Four Chamber, Method of Disk (LVI Dd, LVIDs, LVSd, LVSs) • Left Ventricle Stroke Index, Bi-Plane, Bullet, Method of Disk (LVAd, LVAs) • Interventricular Septum (IVS) • Left Ventricle Internal Diameter (LVI D) • Left Ventricle Posterior Wall Thickness (LVPW)
Mitral valve	• Mitral Valve Annulus Diameter (MV Ann Diam) • E-Point-to-Septum Separation (EPSS) • Mitral Valve Area Planimetry (MVA Planimetry)
Pulmonic valve	• Pulmonic Valve Area (PV Planimetry) • Pulmonic Valve Annulus Diameter (PV Annulus Diam) • Pulmonic Diameter (Pulmonic Diam)
Right atrium	• Right Atrium Diameter, Length (RAD Ma) • Right Atrium Diameter, Width (RAD Mi) • Right Atrium Area (RAA) • Right Atrium Volume, Single Plane, Method of Disk (RAAd) • Right Atrium Volume, Systolic, Single Plane, Method of Disk (RAAs)
Right ventricle	• Right Ventricle Outflow Tract Area (RVOT Planimetry) • Left Pulmonary Artery Area (LPA Area) • Right Pulmonary Artery Area (RPA Area) • Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Diameter, Length (RVD Ma) • Right Ventricle Diameter, Width (RVD Mi) • Right Ventricle Wall Thickness (RVAWd, RVAWs) • Right Ventricle Outflow Tract Diameter (RVOT Diam) • Left Pulmonary Artery (LPA) • Main Pulmonary Artery (MPA) • Right Pulmonary Artery (RPA)
System inferior vena cava	• Systemic Vein Diameter (Systemic Diam) • Patent Ductus Arterosis Diameter (PDA Diam) • Pericard Effusion (PEs) • Patent Foramen Ovale Diameter (PFO Diam) • Ventricular Septal Defect Diameter (VSD Diam) • Interventricular Septum (IVS) Fractional Shortening (IVSd, IVSs)

Supplement: cardiac measurements/calculations *(cont.)*

B-Mode measurements *(cont.)*	
Tricuspid valve	• Tricuspid Valve Area (TV Panimetry) • Tricuspid Valve Annulus Diameter (TV Annulus Diam)

M-Mode measurements	
Aorta	• Aortic Root Diameter (Ao Root Diam) • Aortic Valve • Aortic Valve Diameter (AV Diam) • Aortic Valve Cusp separation (AV Cusp) • Aortic Valve Ejection Time (LVET)
Left atrium	• Left Atrium Diameter to AoRoot Diameter Ratio (LA/Ao Ratio) • Left Atrium Diameter (LA Diam)
Left ventricle	• Left Ventricle Volume, Teichholz/Cubic (LVIDd, LVI Ds) • Left Ventricle Internal Diameter (LVIDd, LVI Ds) • Left Ventricle Posterior Wall Thickness (LVPWd, LVPWs) • Left Ventricle Ejection Time (LVET) • Left Ventricle Pre-Ejection Period (LVPEP) • Interventricular Septum (IVS) • Left Ventricle Internal Diameter (LVI D) • Left Ventricle Posterior Wall Thickness (LVPW)
Mitral valve	• E-Point-to-Septum Separation (EPSS) • Mitral Valve Leaflet Separation (D-E Excursion) • Mitral Valve Anterior Leaflet Excursion (D-E Excursion) • Mitral valve D-E Slope (D-E Slope) • Mitral Valve E-F Slope (E-F Slope) • Mitral Annular Plane Systolic Excursion (MAPSE)
Pulmonic valve	• QRS Complex to End of Envelope (Q-PV close)
Right ventricle	• Right Ventricle Internal Diameter (RVIDd, RVIDs) • Right Ventricle Wall Thickness (RVAWd, RVAWs) • Right Ventricle Outflow Tract Diameter (RVOT Diam) • Right Ventricle Ejection Time (RVET) • Right Ventricle Pre-Ejection Period (RVPEP)
System	• Pericard Effusion (PE (d))
Tricuspid valve	• QRS Complex to End of Envelope (Q-TV close) • Tricuspid Annular Plane Systolic Excursion (TAPSE)

Doppler Mode measurements	
Aortic valve	• Aortic Insufficiency Mean Pressure Gradient (AR Trace) • Aortic Insufficiency Peak Pressure Gradient (AR Vmax) • Aortic Insufficiency End Diastole Pressure Gradient (AR Trace) • Aortic Insufficiency Mean Velocity (AR Trace) • Aortic Insufficiency Velocity Time Integral (AR Trace) • Aortic Valve Mean Velocity (AV Trace) • Aortic Valve Velocity Time Integral (AV Trace) • Aortic Valve Mean Pressure Gradient (AV Trace) • Aortic Valve Peak Pressure Gradient (AR Vmax) • Aortic Insufficiency Peak Velocity (AR Vmax) • Aortic Insufficiency End-Diastolic Velocity(AR Trace) • Aortic Valve Peak Velocity (AV Vmax) • Aortic Valve Peak Velocity at Point E (AV Vmax) • Aorta Proximal Coarctation (Coarc Pre-Duct) • Aorta Distal Coarctation (Coarc Post-Duct) • Aortic Valve Insufficiency Pressure Half Time (AR PHT) • Aortic Valve Flow Acceleration (AV Trace) • Aortic Valve Pressure Half Time (AV Trace) • Aortic Valve Acceleration Time (AV Acc Time) • Aortic Valve Deceleration Time (AV Dec Time) • Aortic Valve Ejection Time (AVET) • Aortic Valve Acceleration to Ejection Time Ratio (AV Acc Time, AVET) • Aortic Valve Area(VTI): AVA (Vmax)
Left ventricle	• Left Ventricle Outflow Tract Peak Pressure Gradient (LVOT Vmax) • Left Ventricle Outflow Tract Peak Velocity (LVOT Vmax) • Left Ventricle Outflow Tract Mean Pressure Gradient (LVOT Trace) • Left Ventricle Outflow Tract Mean Velocity (LVOT Trace) • Left Ventricle Outflow Tract Velocity Time Integral (LVOT Trace) • Left Ventricle Ejection Time (LVET)
Mitral valve	• E' Early diastolic mitral valve annular velocity (E') • E' Avg Averaged early diastolic mitral valve annular velocity (E' Avg) • E' Lat Early diastolic mitral valve lateral annular velocity (E' Lat) • E' Medial Early diastolic mitral valve medial annular velocity (E' Medial) • E' Sept Early diastolic mitral valve septal annular velocity (E'Sept)

Cardiac measurements/ calculations *(cont.)*

Doppler Mode measurements *(cont.)*	
Mitral valve *(cont.)*	• Mitral inflow E velocity to E' ratio (E/E') • Mitral inflow E velocity to E' Avg ratio (E/E' Avg) • Mitral inflow E velocity to E' Lat ratio (E/E' Lat) • Medial Mitral inflow E velocity to E' Medial ratio (E/E') • Mitral inflow E velocity to E' Sept ratio (E/E' Sept) • Mitral Valve Regurgitant Flow Acceleration (MR Trace) • Mitral Valve Regurgitant Mean Velocity (MR Trace) • Mitral Regurgitant Mean Pressure Gradient (MR Trace) • Mitral Regurgitant Velocity Time Integral (MR Trace) • Mitral Valve Mean Velocity (MV Trace) • Mitral Valve Velocity Time Integral (MV Trace) • Mitral Valve Mean Pressure Gradient (MV Trace) • Mitral Regurgitant Peak Pressure Gradient (MR Vmax) • Mitral Valve Peak Pressure Gradient (MV Vmax) • Mitral Regurgitant Peak Velocity (MR Vmax) • Mitral Valve Peak Velocity (MV Vmax) • Mitral Valve Velocity Peak A (MV A Velocity) • Mitral Valve Velocity Peak E (MV E Velocity) • Mitral Valve Area According to PHT (MV PHT) • Mitral Valve Flow Deceleration (MV DecT) • Mitral Valve Pressure Half Time (MV PHT) • Mitral Valve Flow Acceleration (MV AccT) • Mitral Valve E-Peak to A-Peak Ratio (A-C and D-E) (MV E/ARatio) • Mitral Valve Acceleration Time • (MV Acc Time) • Mitral Valve Deceleration Time (MV Dec Time) • Mitral Valve Ejection Time ((MVET) • Mitral Valve A-Wave Duration (MV A Dur) • Mitral Valve Time to Peak (MV TTP) • Mitral Valve Acceleration Time/ Deceleration Time Ratio (MVAcc/Dec Time) • Stroke Volume Index by Mitral Flow (MVA Planimetry, MVTrace)
Pulmonic valve	• Pulmonic Insufficiency Peak Pressure Gradient (PR Vmax) • Pulmonic Insufficiency End-Diastolic Pressure Gradient (PRTrace) • Pulmonic Valve Peak Pressure Gradient (PV Vmax)

Doppler Mode measurements *(cont.)*	
Pulmonic valve *(cont.)*	• Pulmonic Insufficiency Peak Velocity (PR Vmax) • Pulmonic Insufficiency End-Diastolic Velocity (Prend Vmax) • Pulmonic Valve Peak Velocity (PV Vmax) • Pulmonary Artery Diastolic Pressure (PV Trace) • Pulmonic Insufficiency Mean Pressure Gradient (PR Trace) • Pulmonic Valve Mean Pressure Gradient (PV Trace) • Pulmonic Insufficiency Mean Square Root Velocity (PR Trace) • Pulmonic Insufficiency Velocity Time Integral (PR Trace) • Pulmonic Valve Mean Velocity (PV Trace) • Pulmonic Valve Velocity Time Integral (PV Trace) • Pulmonic Insufficiency Pressure Half Time (PR PHT) • Pulmonic Valve Flow Acceleration (PV Acc Time) • Pulmonic Valve Acceleration Time (PV Acc Time) • Pulmonic Valve Ejection Time (PVET) • QRS Complex to End of Envelope (Q-to-PV Close) • Pulmonic Valve Acceleration to Ejection TIme Ratio (PV Acc Time, PVET)
Right ventricle	• Right Ventricle Outflow Tract Peak Pressure Gradient (RVOT Vmax) • Right Ventricle Outflow Tract Peak Velocity (RVOT Vmax) • Right Ventricle Outflow Tract Velocity Time Integral (RVOTTrace) • Right Ventricle Ejection Time (RV Trace) • Stroke Volume by Pulmonic Flow (RVOT Planimetry, RVOTTrace) • Right Ventricle Stroke Volume Index by Pulmonic Flow (RVOT Planimetry, RVOT Trace)
System	• Pulmonary Artery Peak Velocity (PV Vmax) • Pulmonary Vein Velocity Peak A (Reverse) (P Vein A) • Pulmonary Vein Peak Velocity (P Vein D, P Vein S) • Systemic Vein Peak Velocity (PDA Diastolic, PDA Systolic) • Ventricular Septal Defect Peak Velocity (VSD Vmax) • Atrial Septal Defect (ASD Diastolic, ASD Systolic)

Cardiac measurements/ calculations *(cont.)*

Doppler Mode measurements *(cont.)*	
System *(cont.)*	• Pulmonary Vein A-Wave Duration (P Vein A Dur) • IsoVolumetric Relaxation Time (IVRT) • IsoVolumetric Contraction Time (IVCT) • Pulmonary Vein S/D Ratio (P Vein D, P Vein S) • Ventricular Septal Defect Peak Pressure Gradient (VSD Vmax) • Pulmonic-to-Systemic Flow Ratio (Qp/Qs)
Tricuspid valve	• Tricuspid Regurgitant Peak Pressure Gradient (TR Vmax) • Tricuspid Valve Peak Pressure Gradient (TV Vmax) • Tricuspid Regurgitant Peak Velocity (TR Vmax) • Tricuspid Valve Peak Velocity (TV Vmax) • Tricuspid Valve Velocity Peak A (TV A Velocity) • Tricuspid Valve Velocity Peak E (TV E Velocity) • Tricuspid Regurgitant Mean Pressure Gradient (TR Trace) • Tricuspid Valve Mean Pressure Gradient (TV Trace) • Tricuspid Regurgitant Mean Velocity (TR Trace) • Tricuspid Regurgitant Velocity Time Integral (TR Trace) • Tricuspid Valve Mean Velocity (TV Trace) • Tricuspid Valve Velocity Time Integral (TV Trace) • Tricuspid Valve Time to Peak (TV TTP) • Tricuspid Valve Ejection Time (TV Acc/Dec Time) • Tricuspid Valve A-Wave Duration (TV A Dur) • QRS Complex to End of Envelope (Q-TV Close) • Tricuspid Valve Pressure Half Time (TV PHT) • Stroke Volume by Tricuspid Flow (TV Planimetry, TV Trace) • Tricuspid Valve E-Peak to A-Peak Ratio (TV E/A Velocity)

Color Flow Mode measurements	
Aortic valve	• Proximal Isovelocity Surface Area: Regurgitant Orifice Area (AR Radius) • Proximal Isovelocity Surface Area: Radius of Aliased Point (AR Radius) • Proximal Isovelocity Surface Area: Regurgitant Flow (AR Trace) • Proximal Isovelocity Surface Area: Regurgitant Volume Flow (AR Trace) • Proximal Isovelocity Surface Area: Aliased Velocity (AR Vmax)

Color Flow Mode measurements *(cont.)*	
Mitral valve	• Proximal Isovelocity Surface Area: Regurgitant Orifice Area (MR Radius) • Proximal Isovelocity Surface Area: Radius of Aliased Point (MR Radius) • Proximal Isovelocity Surface Area: Regurgitant Flow (MR Trace) • Proximal Isovelocity Surface Area: Regurgitant Volume Flow (MR Trace) • Proximal Isovelocity Surface Area: Aliased Velocity (MR Vmax)

Combination Mode measurements	
Aortic valve	• Aortic Valve Area (Ao Root Diam, LVOT Vmax, AV Vmax) • Aortic Valve Area by Continuity Equation by Peak Velocity (Ao Root Diam, LVOT Vmax, AV Vmax) • Stroke Volume by Aortic Flow (AVA Planimetry, AV Trace) • Cardiac Output by Aortic Flow (AVA Planimetry, AV Trace, HR) • Aortic Valve Area by Continuity Equation VTI (Ao Root Diam, LVOT Vmax, AV Trace)
Left ventricle	• Cardiac Output, Teichholz/Cubic (LVIDd, LVI Ds, HR) • Cardiac Output Two Chamber, Single Plane, Area-Length/Method of Disk(Simpson) (LVAd, LVAs, HR) • Cardiac Output Four Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs, HR) • Ejection Fraction Two Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs) • Ejection Fraction Four Chamber, Single Plane, Area-Length/Method of Disk (Simpson) (LVAd, LVAs) • Left Ventricle Stroke Volume, Single Plane, Two Chamber/Four Chamber, Area-Length (LVAd, LVAs) • Left Ventricle Stroke Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (Simpson) (LVIDd, LVIDs, LVAd, LVAs) • Left Ventricle Volume, Two Chamber/Four Chamber, Area-Length (LVAd, LVAs) • Ejection Fraction, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Stroke Volume, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH) • Left Ventricle Volume, Bi-Plane, Method of Disk (LVAd, LVAs, 2CH, 4CH)

Cardiac measurements/ calculations *(cont.)*

Combination Mode measurements *(cont.)*	
Left ventricle *(cont.)*	• Left Ventricle Stroke Index, Single Plane, Two Chamber/Four Chamber, Area-Length (LVSd, LVSs and BSA) • Left Ventricle Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (LVAd, LVAs) • Left Ventricle Volume, Apical View, Long Axis, Method of Disk (LVAd, LVAs)
Mitral valve	• Stroke Volume by Mitral Flow (MVA Planimetry, MV Trace) • Cardiac Output by Mitral Flow (MVA Planimetry, MV Trace, HR)
Pulmonic valve	• Stroke Volume by Pulmonic Flow (PV Planimetry, PV Trace) • Cardiac Output by Pulmonic Flow (PV Planimetry, PV Trace, HR)
Tricuspid valve	• Cardiac Output by Tricuspid Flow (TV Planimetry, TV Trace, HR)

Cardiac worksheet
Parameter: lists the mode, the measurement folder and the specific measurement
Measured Value: Up to six measurement values for each item. Average, maximum, minimum or last

Generic study in cardiology
Stroke Volume (SV)
Cardiac Output (CO)

Imagination at work

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