Product Description

The LOGIQ Book XP PRO is a high performance multipurpose color hand-carried imaging system designed for abdominal, cardiac, obstetrics, gynecology, vascular, musculoskeletal, small parts, pediatric neonatal and intraoperative applications.

TruScan Architecture

GE’s exclusive, software-intensive ultrasound imaging platform gives you unsurpassed computational power, image-manipulation capability, workflow flexibility and product upgrade ability.

TruAccess is the new, GE-exclusive, raw-data processing technology that will change the future of ultrasound imaging. By accessing raw data, TruAccess applies live scanning techniques to stored image data. This maintains excellent image quality and ensures unsurpassed image management.

SmartScan utilizes new advances in operating algorithms and system operations to improve image acquisition and patient throughput while increasing diagnostic confidence and exam consistency.

ComfortScan is our most advanced ergonomic design ever, helps maximize productivity and simplify every exam you perform. The LOGIQ Book XP has increased flexibility and mobility for all scanning conditions.

General Specification

Dimensions and Weight
• Height: 78 mm (3.07 in) console only
• 99.5 mm (3.92 in) with handle
• Width: 350 mm (13.78 in)
• Depth: 280 mm (11 in) console only
• 320 mm (12.6 in) with handle
• Weight: approx. 4.3 kg (9.5 lb.)
• Weight: approx. 4.7 kg (10.3 lb.) with battery
• Battery weight: approx. 0.4 kg (0.88 lb.)

Electrical Power
• Voltage: 100-240 V AC
• Frequency: 50/60 Hz
• Power: Max. 108 VA with Peripherals

Console Design
• Laptop Style
• Integrated HDD (40GB)
• Wireless LAN Support
• 1 probe port with micro-connector
• Rear handle
• New Color Scheme

User Interface

Operator Keyboard
• Alphanumeric Keyboard
• Ergonomic Hard Key Operations
• Rubber Keyboard file for Russian, Finnish & Swedish, Danish, French and Norwegian
• Integrated Recording Keys for Remote Control of Peripheral Devices and DICOM Devices
• 6 TGC Pods, with Re-mapping functionality at any depth

Display Screen
• 10.4 inch High-Contrast Color LCD
• Display size: 800x600
• Recording area: 640x480
• Interactive Dynamic Software Menu
• Open Angle Adjustable

- 0 to 160°
• Integrated Speakers
• Brightness Adjustment
• Audio Volume Adjustment

System Overview

Applications
• Abdominal
• Cardiac
• Obstetrical
• Gynecological
• Musculoskeletal
• Vascular
• Urological
• Small Parts and Superficial
• Pediatric and Neonatal
• Intraoperative

Scanning Methods
• Electronic Convex
• Electronic Linear with slant scanning
• Virtual Convex
• Electronic Phased array

Transducer Types
• Convex Array
• Microconvex Array
• Linear Array
• Phased array

Operating Modes
• B-Mode
• M-Mode
• Color Flow Mode (CFM)
• Power Doppler Imaging (PDI)
• Pulse Wave Dopler (PWD)
• Triplex
• Harmonic
• 3D (Option)

Standard Features
• High Resolution and High Contrast 10.4 inch Color LCD
**Enhanced**

- Quick Boot Up Time
- Report packages
- Cine memory: The longest Cine is 125 Seconds. The shortest Cine is 14 Seconds
- Cine Frames: Max frames in Cine is over 5000 frames
- 40GB (over 30,000 images) Hard Drive
- External R/W CD ROM for offline image storage and backup
- Loops storage from ‘on the fly’ scanning and from memory
- Automatic Optimization
  - Auto Tissue Optimization: ATO
  - Auto Spectrum Optimization: ASO
- ACE™ (Adaptive Color Enhancement)
- TruAccess, Raw Data Processing
- Patient Information Database
- Image Archive on Hard Drive
- Full M&A Calculation Package with Real Time Auto Doppler Calculations
- Abdominal Calcs
- Vascular Calcs
- Cardiac Calcs
- OB Calcs and Tables
- Gynecological Calcs
- Fetal Trending
- Multi Gestational Calcs
- Urological Calcs
- Renal Calcs

**Software Options**
- Easy 3D
- DICOM 3.0 Connectivity

**Hardware Options**
- Additional battery Pack
- Carrying case
- USB ECG instrument
- Foot Switch
- Cart

**Media & Peripherals**
- External USB DVD-RW (Standard)
- *Note: Only support CD-R, not support DVD-R
- USB thermal B&W printer, Sony UPD-897 (option)
- USB thermal color printer, Sony UPD-23 (option)
- Supports 802.11a/b/g wireless-LAN with the linksys WPC55AG card

- Supports LAN with the Netgear FA511, 32 bits network adapter
- Supports Medical VCR(SVO-9500MD or SVO-9500) via video adapter (TvIEW Micro)
- Support PC printer K550 and HP60
- Supports USB Memory Sticks (Sony MicroVault 64MB/128MB, Lexar 256 and 512MB USB memory sticks)

**Display Modes**
- Simultaneous Capability
  - B/CFM or PDI
  - B/PW
  - B/M
  - Dual B (B/B)
  - Dual B + CFM or PDI
  - B+CFM+PW (Triplex for linear probe)
- Selectable Alternating Modes
  - B/M
  - B/PW
  - B + CFM [PDI]/M
  - B + CFM [PDI]/PW
  - 3D – Modeloption
- Multi Image Split Screen
  - Live and/or frozen
  - B + B/CFM or PDI/Spectral/Harmonic
  - Independent Cine playback
- Zoom: Read/Pan and from archive
- Colorized Image
  - Colorized B
  - Colorized M
  - Colorized PW
- Time line Display
  - Independent Dual B/PW Display
  - Display Formats:
    - Top/ Bottom or Side/ Side selectable
    - Format Size: 1/2: 1/2; 1/3; 2/3, full format, switchable after freeze
  - Independent Dual B/M Display
  - Display Formats:
    - Top/ Bottom or Side/ Side selectable
    - Format Size: 1/2: 1/1; 2/1; 1/1: 1/2, full format

**Display Annotation**
- Institution/Hospital Name
- Date: 3 types selectable
  - YY/MM/DD, MM/DD/YY, DD/MM/YY
- Time: 2 types selectable
  - 24 hours, 12 hours
- Operator Identification
- Patient Name: First, Last & Middle
- Patient Identification: 31 characters

- Gestational Age from LMP/EDC/GA
- Power Output Readout
  - MI: Mechanical Index
  - TI: Thermal Index
- System Status (real-time or frozen)
- Probe Orientation Marker: Coincides with a probe orientation marking on the probe.
- Image Preview
- Gray/Color Bar
- Cine Gauge
- Measurement Results Window: pre-settable display location
- Probe Type
- Application Name
- Imaging Parameters by Mode (current mode)
  - B/M-Mode
    - Frequency
    - Gain
    - Edge Enhance/Frame Averaging
    - Gray Map
    - Image Depth
    - Dynamic Range
    - Frame Rate
    - % of Power Output
  - Color Flow Mode
    - Color Flow Frequency
    - Color Gain
    - Spatial Filter/Packet Size
    - Line Density/Frame Average
    - PRF
    - Wall Filter
    - % of Power Output
  - PW-Mode
    - Doppler Frequency
    - Doppler Gain
    - PRF
    - Wall Filter
    - Sample Volume Width
    - Dynamic Range
    - Angle Correction
    - % of Power Output
- Focal Zone Markers
- Body Pattern: 84 types
- B Scale Markers: 3 types
  - Depth/Width, Depth, Combination
- M Scale Markers: 2 types
  - Time/Depth, Time
- Image Management Menu: Menu, Delete, and Image Manager
- Image Palette
- Caps Lock: On/Off
- System Messages Display
- Trackball Functionality Status: Scroll, M&A (Measurement and Analysis), Position, Size, Scan Area Width and Tilt
- Battery status
Enhanced

- Biopsy Guide Line and Zone
- Heart Rate
- Primary Parameter Menu (depend on current mode)
  - B Mode
    - Frequency
    - Grey Map
    - Dynamic Range
    - Image Rotate
    - Focus Position
    - Colorize
    - Edge Enhance
    - Updown Invert
    - Focus Number
  - Color Flow Mode
    - Frequency
    - Frame Average
    - Angle Steer
    - Packet Size
    - PRF
    - Color Map
    - Threshold
    - Color Invert
    - Wall Filter
  - M Mode
    - Gray Map
    - Dynamic Range
    - Sweep Speed
    - Display Format
    - Colorize
    - Edge Enhance
    - Full Timeline
  - PW Mode
    - Frequency
    - Baseline
    - Quick Angle
    - Sweep Speed
    - PRF
    - SV Length
    - Colorize
    - Angle Correct
    - Spectral Invert
    - Wall Filter
  - Cine Mode
    - Loop Speed
    - Cycle select
    - Start Frame
    - End Frame
    - Frame by Frame
    - Run/Stop
    - Num Cycles
    - First
    - Last

Secondary Parameters Menu (depend on mode)
- B Mode
  - Rejection
  - Frame Average
  - Biopsy
  - Line Density
  - Frequency
  - B Softener
  - Suppression
  - Power Output
- M Mode
  - Rejection
  - Power Output
- CF Mode
  - Baseline
  - Line Density
  - Transparency Map
  - Focus Position
  - AC
  - Capture
  - Spatial Filter
  - Power Output
- PW Mode
  - Rejection
  - Dynamic Range
  - Display Format
  - Full Timeline
  - Trace Direction
  - Auto Calculations
  - Modify Calculs
  - Trace Method
  - Trace Sensitivity
  - Time Resolution
  - Spectral Average
  - Power Output
  - Duplex/Triplex ON or OFF

System Parameter

System Setup
- Diagnostic Categories: 8 types, pre-settable
  - Rad/Abd, OB, GYN, Cardiac, Vasc, Urol, Smallp, Pediatric
- User Programmable Preset Capability
- Factory Default Preset Data
- Languages setup:
  - Chinese, English, French, German, Spanish, Italian, Portuguese, Russian, Greek, Finnish, Swedish, Dutch
- Operation Error Beep
- Body Surface Area: 2 types
  - Oriental, Occidental
- OB Report Format: 4 types

Pre-Processing
- Acoustic Power Output
- Read Zoom up to 18x
- B/M-Mode
  - Gain
  - TGC
  - Image Reverse
  - Depth
  - Scan Area
  - Auto Optimize (AO)
  - Dynamic Range
  - Focus Number
  - Focus Position
  - Line Density
  - Frequency
  - Frame Average
  - Edge Enhance
  - Focus Width
  - M/D Cursor
  - Sweep Speed for M-Mode
- PW-Mode
  - Gain
  - Sample Volume Gate Position, Length
  - PRF
  - Doppler Frequency
  - Dynamic Range
  - Auto Optimize (AOS)
  - Audio Volume
- Color Flow Mode
  - Gain
- ROI Position, Size
- PRF
- Color Line Density
- Color Frequency
- Packet Size
- Threshold
- Frame Average
- Focus Position

**3D Acquisition(option)**
- Scan Distance
- ROI Style
- Display Format
- Scan Plane

**Post-Processing**
- TruAccess: the new, GE-exclusive, raw-data digital processing
- Read Zoom up to 8x
- B/M-Mode
  - Gain
  - Image Reverse
  - Auto Optimize (ATO)
  - Image Rotation
  - Gray Map
  - Colorize
  - Rejection
  - B Softener
  - Sweep Speed for M-Mode

**PW-Mode**
- Gain
- Baseline
- Angle Correct
- Quick Angle
- Doppler Invert
- Display Format
- Sweep Speed
- Full Timeline
- Rejection
- Gray Map
- Colorize
- Compression (Dynamic Range)
- Auto Calcs
- Trace Direction
- Modify Calcs
- Number of Average Cycles
- Trace Method
- Trace Sensitivity
- Auto Optimize (ASO)
- Color Flow Mode
- Gain
- Baseline
- Color Invert
- Color Map
- Threshold
- Frame Average (in loop images)
- Easy 3D (option)
  - Threshold (Optimization)
  - Mix Type 1
  - Render
  - Texture
  - Gray Surface
  - Scalpel
  - Auto Movie
  - Undo
  - Reset

**Imaging Processing and Presentation**

**TrueScan**: software Intensive Ultrasound Imaging Platform

- Digital Beamformer
- 256 Digital Processing Channels Technology
- Displayed Imaging Depth: 2-30 cm, zoom and probe dependent
- Transmission Focus
  - 1 – 8 Focus Points Selectable (probe and application dependent)
  - Focal Zone Position
- Continuous Dynamic Receive / Focus / Aperture
- System Dynamic Range: 165 dB
- Multi-Frequency/Wideband Technology
- 256 Shades of Gray (VGA)
- Adjustable Field of View (FOV)
- Image Reverse: Right/Left
- Image Rotation: 4 steps
  Rotation: 0°, 90°, 180°, 270°

**CINE Memory/Image Memory**

- CINE: 14 - 125 seconds, up to over 5000 frames, dependent on scanning modes and parameters
- CINE Gauge and CINE Image Number Display
- CINE Review: Frame-by-frame, Loop
- CINE Review Speed: 9 types
  1/1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, 1/8, 1/9
- Selectable CINE Sequence for CINE Review
- Start and End Frame Selections for Loop Playback
- Separation Maker to Indicate Time Discontinuity
- Measurements, Calculations and Annotations on CINE Playback
- Scrolling Timeline Memory

**Image Archive/Connectivity**

- Clipboard: displays thumbnail images of the acquired data for the current exam
- Previewsing Clipboard Images: An enlarged preview of the image
- Recalling Images from the Clipboard
- Image Browser: Archived images from past patient exams appear as well as images stored for the current exam
  - Previewing an Image
  - Grouping a Set of Images
  - Analyzing Images
- Image Management
  - Select All/Unselect All
  - Permanent Store
  - Discard all the Temporary Images
  - Delete Selected Image
  - Analyze
- Ethernet Network Connection
- Configurable 3 Print (Recording) Keys (P1-P3) to Multiple Output Devices/Workflows
- Archiving Format:
  - DICOM with ultrasound raw data
  - DICOM
- Capture Area: pre-settable for each print key
  - Video Area
  - Application Window
  - Whole Screen
- Archiving Image Frames: pre-settable for each print key
  - Single: stores single frame only
  - Multiple: stores cine loop
  - Secondary Capture: screen shot
- Image Compression/Picture Quality: pre-settable for each print key
  - Quality: 1 to 100%
- Dataflow: a set of pre-configured services
  - When you select a dataflow, the ultrasound system automatically works according to the services associated with the dataflow
Scanning Parameters

**B-Mode**
- B/M Acoustic Output: 0 – 100%, 2% step
- Image Mode: On/Off
- B Color: 4 types
- Thermal Index: TIC, TIS, TIB
- Softener: 4 steps
- Focus Number: 8 steps
- Line Density: 4 steps (Convex)
  - 6 steps (Linear)
  - 6 steps (Phased array)
- Frame Average: 6 steps
- Edge Enhance: 6 steps
- Angle (deg): probe dependent, 10 – 133°, 10° step
- Gray Scale Map: 14 types
- Gain: 0 – 98 dB, 2 dB step
- Displayed Dynamic Range: 30 – 165 dB, 3 dB step
- Depth: 2 – 30 cm, 1 cm step
- Focus Depth: 9-19 steps, probe dependent, default pre-settable
- Rejection: 7 steps
- Frequency: 3-4 steps, probe dependent
- Frame rate: 508Hz max

**Color Flow Mode**
- Base Line
- Invert: On/Off
- Capture: 4 steps pre-settable
- CF/PDI Focus Depth: 21 steps default pre-settable
- CF/PDI ACE: On/Off
- Displayed Dynamic Range: 24 – 48 dB, 4 dB step
- CF/PDI Acoustic Output: 0 – 100%, 10% step
- Packet Size: 6, 8, 10, 12, 14 (Convex) 8, 10, 12, 14, 16 (Linear)
- Line Density: 4 steps (Convex)
  - 6 steps (Linear)
  - 6 steps (Phased array)
- Frame Average: 8 steps
- PRF: 0.3K-9.3K Hz (Depth dependent)
- Spatial Filter: 6 steps
- Gain: 0 – 40 dB, 0.5 dB step
- Wall Filter: 7 steps
- Angle/Width (deg, mm): probe dependent
- CF/PDI Vertical Size (mm): default pre-settable
- CF/PDI Center Depth (mm): default pre-settable
- CF/PDI Frequency: 2-3 steps, probe dependent
- CF/PDI Focal Number: 1
- Color Map: 11 types
- Color Threshold: 10 – 100%, 5% step

**PDI-Mode**
- PDI Map: 13 types
- CF/PDI ACE: On/Off
- CF/PDI Focus Depth: 21 steps default pre-settable
- Displayed Dynamic Range: 24 – 48 dB, 4 dB step
- CF/PDI Acoustic Output: 0 – 100%, 10% step
- Packet Size: 6, 8, 10, 12, 14 (Convex) 8, 10, 12, 14, 16 (Linear)
- Spatial Filter: 6 steps
- Frame Average: 7 steps
- PRF: 0.3K-9.3K Hz (Depth dependent)
- Power Threshold: 10 – 100%, 5% step
- CF/PDI Vertical Size: default pre-settable
- CF/PDI Center Depth: default pre-settable
- CF/PDI Focal Number: 1
- Gain: 0 – 40 dB, 0.5 dB step
- Wall Filter: 7 steps
- CF/PDI Frequency: 2-3 steps, probe dependent

**M-Mode**
- Sweep Speed: 8 steps
- M Color: 4 types
- B/M Acoustic Output: 0 – 100%, 2% step
- Rejection: 6 steps
- Displayed Dynamic Range: 30 – 165 dB, 3 dB step
- Edge Enhance: 6 steps
- Gray Scale Map: 14 types
- M Gain: 0 – 98 dB, 2 dB step

**PW-Mode**
- Gray Scale Map: 4 types
- Displayed Dynamic Range: 24 – 48, 4 dB step
- Base Line: 0 – 100%, 10% step
- SV Gate: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16 mm
- Valid Angle Correct: +/- 60°, 1° step
- Spectral Color: 4 types
- PW Sweep Speed: 8 steps
- PRF: 0.7K-11.9K Hz (Depth dependent)
- Invert: On/Off
- PW Acoustic Output: 0 – 100%, 10% step
- Spectral Averaging: 3 steps pre-settable
- Time Resolution: 4 steps
- CFM/PWD Ratio: 1, 2, 4
- Rejection: 15 steps
- Gain: 0 – 32 dB, 1 dB step
- Wall Filter: 60-500Hz
- 0 degree angle Velocity: 15-435cm/s
- Sample Volume Depth: image depth dependent
- PW/CBPDI Angle Steer: +/-20 deg. (I12L-RS)
- Audio Volume
• PW Frequency: 2-3 steps, probe dependent
• HPRF: Maximal measurement velocity Probe and depth dependent [3S-RS Maximal Velocity 6m/s]

Measurements / Calculations

General Measurements/Calculations

Mode Measurement
• B-Mode
  - Distance
  - Circumference/Area (Ellipse/Trace)
• M-Mode
  - Tissue Depth (Distance)
  - Time Interval
  - Depth Difference with Time Interval and Slope
• Doppler Mode
  - Velocity
  - TAMAX, TAMIN, and TAMEAN (Manual/Auto Trace)
  - Two Velocities with Slope and Time Interval
  - Time Interval

Generic Measurement
• B-Mode
  - % Stenosis
  - Volume
  - Angle
  - A/B Ratio
• M-Mode
  - % Stenosis
  - A/B Ratio
  - Heart Rate
• Doppler Mode
  - PI (Pulsatility Index)
  - RI (Resistive Index)
  - S/D Ratio
  - D/S Ratio
  - A/B Ratio
  - Max PG (Pressure Gradient)
  - Mean PG (Pressure Gradient)
  - SV (Stroke Volume)
  - FV (Flow Volume)
  - Heart Rate

Obstetrics Measurements/Calculations

• Abdominal Circumference (AC)
• Amniotic Fluid Index (AFI) (Moore)
• Antero-PosteroTrunk Diameter and Transverse Trunk Diameter (APTD-TTD)
• Antero-PosteroTrunk Diameter by Transverse Trunk Diameter (AxT)
• Biparietal Diameter (BPD)
• Crown Rump Length (CRL)
• Cardio-Thoracic Area Ratio (CTAR)
• Estimated Fetal Weight [EFW]
• Femur Length (FL)
• Foot Length (FT)
• Gestational Sac (GS)
• Head Circumference (HC)
• Humerus Length (HL)
• Length of Vertebra (LV)
• Occipitofrontal Diameter (OFD)
• Transverse Abdominal Diameter (TAD)
• Transverse Cerebellar Diameter (TCD)
• Thorax Transverse Diameter (THD)
• Tibia Length (Tibial)
• Ulna Length (Ulna)
• Multi-Gestational Calculations
  - Up to 4 fetuses
  - Comparison of multiple fetus data on a graph and a worksheet

OB Worksheet
• Patient Information
  - Fetus Number
  - CUA/AUA Selection
  - Fetus Position
  - Placenta
• Measurement Information
  - AC
  - HC
  - OFD
  - BPD

• Doppler Abdomen and Renal Artery Exam Calcs
  - Acceleration
  - Acceleration Time (AT)
  - Peak Systole (PS), End Diastole (ED), or Mid Diastole (MD)
  - Pulsatility Index (PI)
  - S/D or D/S Ratio
  - Resistive Index (RI)
  - TAMAX
• Thyroid Length, Width, and Height

OB Graphs
• Fetal Growth Curve Graphs
  - Normal growth curve, positive and negative standard deviations or applicable percentiles, and ultrasound age of the fetus
  - One measurement per graph
  - Single or Quad views
• Fetal Growth Bar Graph
  - Ultrasound age and gestational age
  - Plots all measurements on one graph

Gynecology Measurements/Calculations
• Ovary Length, Width, and Height
• Uterus Length, Width, and Height
• Ovarian Follicle Measurements
  - 1 distance
  - 2 distances
  - 3 distances
• Endometrium thickness (Endo)

Cardiology 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 Plan)
  - (Trans AV)
• 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)

**Left Ventricle**
- Left Ventricle Mass (LVPWD, LVPWs)
- Left Ventricle Volume, Teichholz/Cubic (LVId, LVI Ds)
- Left Ventricle Internal Diameter (LVId, LVI Ds)
- Left Ventricle Posterior Wall Thickness (LVPWD, LVPWs)
- Left Ventricle Length (LV Major)
- Left Ventricle Width (LV Minor)
- Left Ventricle Area, Two Chamber/ Four Chamber/ Short Axis (LVA [di], LVA [si])
- Left Ventricle Endocardial Area, Width (LVA [di], LVA [si])
- Left Ventricle Epicardial Area, Length (LVAepi [di], LVAepi [si])
- Left Ventricle Mass Index (LVPWD, LVPWs)
- Ejection Fraction, Teichholz/Cube (LVId, LVId)
- Left Ventricle Posterior Wall Fractional Shortening (LVPWD, LVPWs)
- Left Ventricle Stroke Index, Teichholz/Cube (LVId, LVId, and Body Surface Area)
- Left Ventricle Fractional Shortening (LVId, LVId)
- Left Ventricle Stroke Volume, Teichholz/Cubic (LVId, LVId)
- Left Ventricle Stroke Index, Single Plane, Two Chamber, Method of Disk (LVI Dd, LVI Dds, LV5d, LV5s)
- Left Ventricle Stroke Index, Single Plane, Four Chamber, Method of Disk (LVI Dd, LVId, LVId, LV5d, LV5s)
- Left Ventricle Stroke Index, Bi-Plane, Bullet, Method of Disk (LVAd, LVAs)
- Left Ventricle Internal Diameter (LVId)
- Left Ventricle Posterior Wall Thickness (LVPW)

**M-Mode Measurements**
- Mitral Valve
  - Mitral Valve Annulus Diameter (MV Ann Diam)
  - Mitral Valve Area by Pressure Half Time (MVA By PHT)
  - Mitral Valve Area Planimetry (MVA Planimetry)

- Pulmonary Valve
  - Pulmonary Valve Annulus Diameter (PV Annulus Diam)

- Right Atrium
  - Right Atrium Diameter, Length (RAD Ma)
  - Right Atrium Diameter, Width (RAD Mi)
  - Right Atrium Area (RAA)

- Right Ventricle
  - 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
  - Interventricular Septum Thickness (IVSd, IVSs)
  - Inferior Vena Cava
  - Pulmonary Artery Diameter (MPA)
  - Systemic Vein Diameter (Systemic Diam)
  - Patent Ductus Arteriosus Diameter (PDA Diam)
  - Pericard Effusion (PES)
  - Patent Foramen Oval Veins Diameter (PFO Diam)
  - Ventricular Septal Defect Diameter (VSD Diam)
  - Interventricular Septum (IVS) Fractional Shortening (IVSd, IVSs)

- Tricuspid Valve
  - Tricuspid Valve Area (TV Planimetry)
  - Tricuspid Valve Annulus Diameter (TV Annulus Diam)

- Left Ventricle Internal Diameter (LVIDd, LVID 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 (LVID 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)

- Pulmonic Valve
  - QRS complex end of envelope (Q-to-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)
  - Velocity Circumferential Fiber Shortening (Vcf)

- System
  - Interventricular Septum Thickness (IVSd, IVSs)
  - Pericard Effusion (PES)
  - Interventricular Septum (IVS) Fractional Shortening (IVSd, IVSs)

- Tricuspid Valve
  - QRS complex end of envelope (Q-to-TV close)

**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 Mean Square Root Velocity (AR Trace)
  - Aortic Insufficiency Velocity Time Integral (AR Trace)
Enhanced

- Aortic Valve Mean Velocity (AV Trace)
- Aortic Valve Mean Square Root Velocity (AV Trace)
- Aortic Valve Velocity Time Integral (AV Trace)
- Aortic Valve Mean Pressure Gradient (AV Vmax)
- 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)
- 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 Trace)
- Aortic Valve Ejection Time (AVET)
- Aortic Valve Acceleration to Ejection Time Ratio (AV Acc Time, AVET)
- Aortic Valve Area according to PHT

• Left Ventricles
  - 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 Mean Square Root Velocity (LVOT Trace)
  - Left Ventricle Outflow Tract Velocity Time Integral (LVOT Trace)
  - Left Ventricle Ejection Time (LVET)
  - Cardiac Output by Aortic Flow (AVA Planimetry, AV Trace)
  - Stroke Volume Index by Aortic Flow (AVA Planimetry, AV Trace)

• Mitral Valve
  - Mitral Valve Regurgitant Flow Acceleration (MR Trace)
  - Mitral Valve Regurgitant Mean Velocity (MR Trace)
  - Mitral Regurgitant Mean Square Root Velocity (MR Trace)
  - Mitral Regurgitant Mean Pressure Gradient (MR Trace)

• Pulmonic Valve
  - Pulmonic End-Diastolic Velocity (PV Vmax)
  - Pulmonary Artery Diastolic Pressure (PV Trace)
  - Pulmonary Insufficiency Mean Pressure Gradient (PV Trace)
  - Pulmonic Valve Mean Pressure Gradient (PV Trace)
  - Pulmonic Insufficiency Mean Velocity (PV Trace)
  - Pulmonic Insufficiency Mean Square Root Velocity (PV Trace)
  - Pulmonic Insufficiency Velocity Time Integral (PV Trace)
  - Pulmonic Valve Mean Velocity (PV Vmax)
  - Pulmonic Valve Mean Square Root Velocity (PV Trace)
  - Pulmonic Valve Velocity Time Integral (PV Trace)
  - Pulmonic Valve Ejection Time (PVET)
  - ORS complex to end of envelope (Q-to-PV close)
  - Pulmonic Valve Acceleration to Ejection Time Ratio (PV Acc Time, PVET)
  - Pulmonic Valve Pre-Ejection to Ejection Time Ratio (PVET)

• System
  - Pulmonary Artery Peak Velocity (PV Vmax)
  - Pulmonary Vein Velocity Peak A (Reversal P Vein A)
  - Pulmonary Vein Peak Velocity (P Vein D, P Vein S)
- Pulmonary Artery Velocity Time Integral (PV Trace)
- Pulmonary Vein S/D Ratio (P Vein D, P Vein S)
- Tricuspid Valve
  - Tricuspid Regurgitant Peak Pressure Gradient (TR Vmax)
  - Tricuspid Valve Peak Pressure Gradient (TV Vmax)
  - Tricuspid Regurgitant Velociy (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 Mean Square Root Velocity (TR Trace)
  - Tricuspid Regurgitant Velocity Time Integral (TR Trace)
  - Tricuspid Valve Mean Velocity (TV Trace)
  - Tricuspid Valve Mean Square Root Velocity (TV Trace)
  - Tricuspid Valve Velocity Time Integral (TV Trace)
  - Tricuspid Valve Time to Peak (TV Acc/Dec Time)
  - Tricuspid Valve Ejection Time (TV Acc/Dec Time)
  - QR5 complex to end of envelope [Q-to-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 Isovelcity Surface Area: Regurgitant Flow (AR Trace)
  - Proximal Isovelcity Surface Area: Regurgitant Volume Flow (AR Trace)
  - Proximal Isovelcity Surface Area: Aliesed Velocity (AR Vmax)
- Mitral Valve
  - Proximal Isovelcity Surface Area: Radius

**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 [LVId, 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] [LVId, 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]
    - Left Ventricle Stroke Index, Single Plane, Two Chamber/Four Chamber, Area-Length [LVsd, LVs, and BSA]
    - Left Ventricle Volume, Single Plane, Two Chamber/Four Chamber, Method of Disk (LVAd, LVAs)
    - Left Ventiricle Volume, Apical View, Long Axis, Method of Disk (LVAd, LVAs)
    - Stroke Volume by Aortic Flow [AVA Planimetry, AV Trace]
- 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 Values: Up to six measurement values for each item. Average, maximum, minimum, or last

**Vascular Measurements/Calculations**

**Exam Categories**
- Generic
- Carotid Artery
- Lower Extremity Artery
- Lower Extremity Vein
- Abdomen
- Renal Artery
- Upper Extremity Artery
- Upper Extremity Vein

**B-Mode Measurements**
- % Stenosis
  - Diameter
  - Area
- Volume
  - One distance
  - Two distances
  - Three distances
  - One ellipse
  - One distance and one ellipse
- A/B Ratio
  - Diameter
  - Area
M-Mode Measurements
- % Stenosis
  - Diameter
- A/B Ratio
  - Diameter
  - Time
  - Velocity

Doppler Mode Measurements

Auto Vascular Calculation
- Acceleration
- Acceleration Time (AT)
- End Diastole (ED), Mid Diastole (MD) or Peak Systole (PS)
- ED/PS or PS/ED Ratio
- Heart Rate
- Pulsatility Index (PI)
- Resistive Index (RI)
- TAMAX
- Edit Trace

Vascular Worksheet
- Vessel Worksheet
- Vessel Summary
- Examiner’s Comments
- Generic Worksheet
- Intravessel Ratio

Pediatrics Measurements/Calculations
- Hip Dysplasia
- Alpha HIP
- dD Ratio

Urology Measurements/Calculations
- PSAD
- PPSA

Probes
- 3C-RS Wide Band Convex Probe
  - Applications: Abdomen, OB Gyn, Urology
  - Probe Frequency Range: 2.0 – 5.0 MHz
  - Number of Element: 128
  - Convex Radius: 55 mmR
  - FOV: 58°
  - Physical Foot Print: 57 x 10 mm
  - B-mode Imaging Frequency: 3.0, 4.0, 5.0 MHz
  - Harmonic Frequency: 4.0MHz, 5.0MHz, 5.2MHz (5.2MHz means the amalgamation of Fundament wave and Harmonic wave)
  - Doppler Frequency Range: 2.0 – 5.0 MHz
  - Doppler Frequency: 2.5, 3.3 MHz
  - Biopsy Guide Available: Multi Angle, Reusable Bracket, Disposable Sleeve

- 8L-RS Wide Band Linear Probe
  - Applications: Vascular, Small Parts, Neonatal, Pediatrics
  - Number of Element: 128
  - FOV(max): 40mm
  - Probe Frequency Range: 4.0 – 11.0 MHz
  - B-mode Imaging Frequency: 6.0, 8.0, 10.0 MHz
  - Doppler Frequency: 4.0, 4.4, 5.0 MHz
  - Steered Angle: +/-20°
  - Biopsy Guide Available: Multi Angle, Reusable Bracket, Disposable Sleeve

- 3S-RS Wide Band Phased array Probe
  - Applications: Cardiac, Abdomen, OB Gyn, Urology (need to check)
  - Probe Frequency Range: 2.0 – 5.0 MHz
  - Number of Element: 64
  - FOV: 90°
  - Physical Foot Print: 18.5x 11.5 mm
  - B-mode Imaging Frequency: 2.5, 3.0, 3.6 MHz
  - Harmonic Imaging Frequency: 2.8, 3.2, 3.6MHz
  - Doppler Frequency Range: 2.0 – 3.6 MHz
  - CFM Imaging Frequency: 1.5MHz, 2.0MHz
  - Doppler Frequency: 1.5MHz, 2.0MHz
  - Biopsy Guide Available: Multi Angle

- EBC-RS Wide Band Microconvex Probe
  - Applications: OB, Gyn, Urology, Endocavity
  - Probe Frequency Range: 4.0 – 10.0 MHz
  - Number of Element: 128
  - Convex Radius: 11 mmR
  - FOV: 133°
  - Physical Foot Print: 26 x 5 mm
  - B-mode Imaging Frequency: 6.0, 8.0, 10.0 MHz
  - Doppler Frequency Range 4.0 – 10 MHz
  - Doppler Frequency: 4.0, 5.0 MHz
  - Biopsy Guide Available: Fixed Angle, Disposable

- 8C-RS Wide Band Microconvex Probe
  - Applications: Pediatrics
  - Probe Frequency Range: 4.0 – 10.0 MHz
  - Number of Element: 128
  - Convex Radius: 11 mmR
  - FOV: 133°
  - Physical Foot Print: 26 x 5 mm
  - B-mode Imaging Frequency: 6.0, 8.0, 10.0 MHz
  - Doppler Frequency Range 4.0 – 10 MHz
  - Doppler Frequency: 4.0, 5.0 MHz
  - Biopsy Guide Available: Biopsy not

Support
- 12L-RS Wide Band Linear Probe
  - Applications: Vascular, intraoperative
  - Probe Frequency Range: 4.0 – 10.0 MHz
  - Number of Element: 96
  - FOV(max): 40 mm
  - Physical Foot Print: 25x7 mm
  - B-mode Imaging Frequency: 6.0, 8.0, 10.0 MHz
  - Doppler Frequency Range: 4.0 – 10.0
  - Doppler Frequency: 4.4, 5.0 MHz
  - Steered Angle: +/-15°
  - Biopsy Guide Available: Biopsy not

- i739L-RS Wide Band Linear Probe
  - Applications: Vascular, intraoperative
  - Probe Frequency Range: 4.0 – 10.0 MHz
  - Number of Element: 96
  - FOV(max): 40 mm
  - Physical Foot Print: 39x6 mm
  - B-mode Imaging Frequency: 6.0, 8.0, 10.0 MHz
  - Doppler Frequency Range: 4.0 – 10MHz
  - Doppler Frequency: 4.4, 5.0 MHz
  - Steered Angle: +/-15°

T739L-RS Wide Band Linear Probe
  - Applications: Vascular, intraoperative
  - Probe Frequency Range: 4.0 – 10.0 MHz
  - Number of Element: 96
  - FOV(max): 40 mm
  - Physical Foot Print: 39x6 mm
  - B-mode Imaging Frequency: 6.0, 8.0, 10.0 MHz
  - Doppler Frequency Range: 4.0 – 10 MHz
  - Doppler Frequency: 4.4, 5.0 MHz
  - Steered Angle: +/-15°

Inputs and Outputs
- Outputs
  - SVGA
- Connectors
  - USB (ECG, Footswitch, CD-RW, digital printer, memory sticks)
  - Card bus (PCMCIA)
  - DC Power input

Safety Conformance

The LOGIQ Book is:
Enhanced

- Listed to UL 2601-1 by a Nationally Recognized Test Lab
- Certified to CSA 22.2, 60601.1 by TUV Test Lab
- Conforms to the following standards for safety:
  - IEC 60601-1 Electrical medical equipment
  - IEC 60601-1-1 Electrical medical equipment
  - IEC 60601-1-2 Electromagnetic compatibility
  - IEC 60601-1-4 Programmable medical systems
  - IEC 60601 –2-37
  - IEC 61157 Declaration of acoustic output
  - ISO 10993 Biological evaluation of medical devices
- NEMA UD3 Acoustic output display (MI, TIS, TIB, TIC)

GE LOGIQ Book XP is designed for compatibility with 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. GE Healthcare makes no claims concerning the safety or effectiveness of contrast agents.

Not all features or specifications described in this document may be available in all probes and/or modes.

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