PHILIPS

Ultrasound

Lumify

Right. Where you need it.

Philips Lumify 5.1 Ultrasound System specifications for Android

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1. Introduction

Get ultrasound imaging of exceptional quality on your compatible smart device with Lumify, the app-based ultrasound solution from Philips. Lumify helps provide clarity at the point of care through advanced imaging capabilities, easy-to-use interface, time-saving automation and presets that optimize the transducer to the exam.

1.1 Indication for use

- Fetal/Obstetric
- Abdominal
- Pediatric
- Cephalic
- Urology
- Gynecological
- Cardiac fetal echo
- Small organ
- Musculoskeletal
- Peripheral vessel
- Carotid
- Cardiac
- Lung
- Transvaginal
- Ophthalmic

Key advantages

- **Combines the exceptional quality of Philips imaging technology with the mobility and connectivity of a compatible smart device**
- **Integrated tele-ultrasound powered by Reacts facilitates real-time collaboration**
- **Allows hand-held ultrasound on your device with accessible pricing**
- **Provides an intuitive interface to help guide decision-making to a confident treatment plan**

2. System overview

2.1 System architecture

- Next-generation micro-digital broadband beamformer
- Microfine 2D focusing with dynamic focal tuning
- Dynamic range up to 170 dB (full-time input)
- 65,536 digitally processed channels
- Tissue Harmonic Imaging
- SonoCT real-time beam-steered compound imaging
- xRes adaptive image processing
- Auto Scan: no-touch continuous intelligent optimization for 2D
- Gray shades: 256 (8 bits) in 2D
- Acquisition frame rate: up to 79 frames per second in high frame rate mode (dependent on field of view)
- ECO design for power saving when transducer detects inactivity, providing you with longer battery life for ultimate portability
- Up to 7.5 hours of continuous scan (depending on smart device connected)

2.2 Imaging modes

2D mode

- Microfine 2D focusing
- Auto Scan
- Digital reconstructed zoom up to three times with pan capability with intuitive multi-touch control
- Cineloop image review (up to 10-second loop length)
- 256 (8 bits) discrete gray levels Philips microfine 2D focusing
- Intuitive "Pinch" to zoom and "Touch" to pan image
- Full-screen mode
  - Available in live-imaging or review

Color Doppler

- Gain 0 to 100 in steps of one
- Cineloop review
- Velocity display
- Touch-controlled color Region of Interest: size and position
- Touch-controlled color steering
- Filters, color sensitivity, scale, line density, smoothing, echo write priority, color persistence, gain and baseline optimized automatically by preset

Pulsed Wave Doppler

- Available on all Lumify transducers
- Available in all imaging exams (except OB early and ocular presets for safety purposes)
- Measurement tools for quantitative analysis
- iScan in Pulsed Wave Doppler mode for auto adjustment on scale and baseline

M-mode

- Available on all transducers (except ocular preset for safety purposes)
- Time markers: 0.2 seconds
- Simultaneous live 2D image

2.3 Image optimization

SonoCT real-time compound imaging

- High precision beam-steered image compounding acquires additional tissue imaging information compared to orthogonal beams and reduces angle-generated artifacts
- Multiple beam-steered lines of sight
- Operates in conjunction with harmonic and xRes imaging

Tissue Harmonic Imaging

- System processing of second harmonic frequencies (nonlinear energy) in tissue
- Extends high performance imaging capabilities to most patient body types
- Available in 2D imaging mode
- Image display with reduced artifacts

xRes adaptive imaging processing

- Enhances images without altering the image resolution
- Reduces artifacts, enhances contrast resolution, visibility of tissue texture patterns and border definition
- Available in 2D, zoom, post-freeze and when capturing loops
- Applied to grayscale 2D image data
- Specifically optimized for each clinical application

Auto Scan intelligent optimization

- No-touch continuous intelligent optimization
- In 2D mode, automatically identifies tissue type and continuously adjusts TGC and receiver gain to achieve tissue uniformity and brightness

2.4 Auto B-line quantification

- Real-time, AI-powered auto detection and count of single and merged B-line during lung imaging
- Guided scan protocol for comprehensive lung exam (12 regions)
- User editable B-line count
- Comprehensive lung exam summary page
- This feature is available on the Lung preset of L12-4, S4-1, and C5-2 transducers

2.5 Auto EF Quantification

- An AI-based software that calculates the Ejection Fraction (EF) from the apical 4 chamber (A4C) view, objectively and automatically for the assessment of the global function of the left ventricle
- Automated End-Diastolic Volume (EDV), End-Systolic Volume (ESV) and Ejection Fraction (EF) calculation
- User editable contour for adjustment
- This feature is available on the Cardiac preset of S4-1 transducer

2.6 Touchscreen interface

- Multi-touch user interface
- Alphanumeric QWERTY soft keyboard with Android voice recognition
- Imaging mode keys: 2D, color Doppler, PW Doppler, and M-mode
- 2D image controls: depth, freeze, gain and power
- Depth to 30 cm (exam-specific)
- Measurements: 2D distance and ellipse calculations, M-mode calculations, PW Doppler calculations
- Color Doppler controls: angle, scale (fast/slow flow) gain
- PW Doppler controls: SV angle, SV size, steer, PW activate, Scale, PW gain, PW iScan, sweep speed, invert, and PW exit
- Image acquisition keys: review, save image and save loop
- Annotation controls: text, move, erase, clear all

3. Workflow

3.1 Home screen

- Simplified home screen for quick access to scan, create patient profile and select presets
- Main menu
- Configurable cardiac image orientation

3.2 Display information

- On-screen display of all pertinent imaging parameters for complete documentation, including transducer type and frequency range, active clinical options and optimized presets, display depth, grayscale, color map, color scale, frame rate, 2D gain, color gain, color image mode and patient name
- Depth to 30 cm (exam-specific)
- Real-time display of Mechanical Index (MI)
- Real-time display of Thermal Index (TIb, TIc, TIs)
- Annotation text – places, moves, erases, modifies or appends typed text
- Annotation erased with start of new study
- On-display centerline marker aligned with transducer centerline marker
- End Exam – closes study and returns user to home screen for efficient workflow
- Network connectivity icon to allow immediate feedback about network condition
- Battery status icon and warning to allow immediate feedback about battery condition (depending on compatible smart device chosen)

3.3 Cineloop review

- Acquisition, storage in memory, and display in real time of up to 10 seconds of 2D, color Doppler, and PW Doppler imaging
- Images for retrospective review and image selection
- Slide control of frame-by-frame image selection
- Functions in 2D, color Doppler, and PW Doppler imaging

3.4 Exam documentation

- Input and output ports (depending on compatible smart device chosen)
  - USB port on smart device; uses include connecting the transducer, supporting data transfer and charging
  - Some devices include video output*
  - Wi-Fi/cellular; uses include DICOM networking, emailing exams and network shared drive connection for EMR

3.5 Connectivity

- Configurable barcode reader software utilizing device camera
- Tele-ultrasound capabilities with real-time two-way video and audio calls using the Reacts technology
- Storage Options
  - Patient data temporarily stored on the device
  - Direct digital storage of single-frame color and B/W images to internal storage
  - Direct digital storage of B/W and color loops to internal storage
  - Configurable to leverage off customer's in-house long-term storage solution of choice
- Export Options
  - PC format (MP4 loops, PNG still-frames) export to network share drive, thumb drives, and local directory
  - Ability to export in PC format (patient data anonymization) or direct connection to PC
- Secure DICOM Capabilities
  - Modality Performed Procedure Step (MPPS)
  - DICOM modality worklist (query retrieve)
  - DICOM image store
  - Export of DICOM files to network share drive, thumb drives, and local directory
  - Option to configure patient data in the DICOM header and images (not DICOM tags), as well as anonymize

3.6 Measurements

- 2D: multiple distance calipers, ellipse tool with area and circumference
- Fetal measurement and analysis: BPD, HC, AC, FL (Hadlock), CRL, Mean Sac Diameter, LMP/EDD, fetal age summary
- Fertility measurements: Endometrial thickness and two 2D distances for up to 15 follicles for each ovary
- M-mode (exam specific): Distance, Slope, Time, FHR
- PW Doppler (exam specific): PSV, EDV, RI, MDV, S/D Ratio, Vmax, MaxPG, MeanPG, VTI, Time

* Specific capabilities such as internal storage size, ports, video connection and cellular connectivity depend on the specific user-selected host smart device.

4. Integrated tele-ultrasound

Lumify integrated tele-ultrasound powered by Reacts allows a live ultrasound stream to be shared with another Reacts user on their Lumify system, mobile device, or computer for real-time collaboration.

- Face-to-face video sharing
- Live ultrasound streaming
- Two-way audio sharing
- Two-way virtual pointer

5. Transducers

5.1 Transducer application guide

Transducer	C5-2	L12-4	S4-1
Type of array	Curved	Linear	Phased
Number of elements	128	128	64
Field of view	67.5^0	34.5 mm	90^0
Broadband frequency range	5 to 2 MHz	12 to 4 MHz	4 to 1 MHz
Maximum depth	30 cm	12 cm	30 cm
Weight	136 g/4.8 oz (without cable)	108 g/3.8 oz (without cable)	96 g/3.4 oz (without cable)
Dimensions	11.4 cm x 4.5 cm x 3.1 cm 4.5 in x 1.8 in x 1.2 in (H x W x D)	11.4 cm x 4.5 cm x 3.1 cm 4.5 in x 1.8 in x 1.2 in (H x W x D)	10.2 cm x 5.1 cm x 3.1 cm 4 in x 2 in x 1.2 in (H x W x D)
Radius of Curvature (ROC)	50 mm	N/A	N/A
Footprint	N/A	41.1 mm	25.5 mm
Continuous dynamic receive focusing	•	•	•
2D imaging	•	•	•
Color Doppler imaging	•	•	•
Tissue Harmonic Imaging	•	•	•
Pulsed Wave Doppler	•	•	•
Lightweight replaceable USB cable	•	•	•

5.1 Transducer application guide (continued)

Optimized presets	C5-2	L12-4	S4-1
Lung	•	•	•
MSK		•	
Soft tissue		•	
Superficial		•	
Vascular		•	
Ocular		•	
Abdomen	•		•
Cardiac			•
FAST			•
OB/GYN	•		•
Gallbladder	•		
OB early			
Gyn pelvis			
Fertility			
Indication for use			
Peripheral vessel		•	
Carotid		•	
Small organ		•	
Musculoskeletal (superficial)		•	
Musculoskeletal (conventional)		•	
Lung	•	•	•
Pediatric	•	•	•
Abdominal	•	•	•
Ophthalmic		•	
Cardiac adult			•
Cardiac pediatric			•
Gynecological	•		•
Neonatal cephalic			•
Adult cephalic			•
Fetal/obstetric	•		•
Fetal echo	•		
Urology	•		
Transvaginal			

6. Smart device compatibility

Please check the Lumify Android Compatibility list, validated by Philips as guidance. Lumify is also compatible with identified iOS devices, please refer to separate Lumify iOS Product Specifications for details.

For a list of compatible smart device options visit:
https://www.philips.com/lumify-compatible-devices

7. Other specifications

7.1 Localization options

Lumify App – Danish, Dutch, English, French, German, Italian, Norwegian, Portuguese, Simplified Chinese, Spanish and Swedish.

7.2 Training and user documentation

Bulgarian, Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Indonesian, Italian, Japanese, Kazakh, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Simplified Chinese, Slovakian, Slovenian, Spanish, Swedish, Traditional Chinese, Turkish, Ukrainian, and Vietnamese.

7.3 Electrical safety standards

- IEC 60601-1, Medical Electrical Equipment: General requirements for safety, including all applicable collateral and particular standards, as well as all applicable deviations
- IEC 60601-1-2, Collateral Standard, Electromagnetic compatibility – requirements and test
- IEC 60601-2-37, Particular Requirements for the basic safety and essential performance of ultrasonic medical diagnostic and monitoring equipment
- ANSI/AAMI ES60601-1, Medical Electrical Equipment: General requirements for basic safety and essential performance

7.4 Environmental standards

- Home Healthcare standard (60601-1-11)
- EMT standard (60601-1-12)
- Military standard for helicopter – RTCA DO-160G

7.5 Agency approvals

- CE Mark in accordance with the European Medical Device Directive issued by British Standards Institute (BSI)

For more product information and support:
www.philips.com/lumify

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