GE Healthcare

EchoPAC Software Only v204

Product Description

EchoPAC™ Software Only is a comprehensive clinical software package for viewing, analyzing and reporting of multi-dimensional echo, vascular and abdominal ultrasound images. EchoPAC Software Only provides basic and advanced viewing and quantitative analysis capabilities for 2D, 4D and multi-dimensional ultrasound parametric images from the GE Healthcare Vivid™ family of scanners, as well as DICOM® images from other ultrasound systems.

Physical Product

- Installation UFD
- User manual
- Installation manual
- Container box
- Option key (password)
- Dongle for licensing (USB)

Extension of the Vivid Scanner Product Line

EchoPAC Software Only extends the accessibility and functionality of GE Healthcare's Vivid product to an offline clinical workstation. Through our TruScan Raw Data Architecture, EchoPAC Software Only displays exams with the original data sets from the Vivid scanners.[1] Consequently users are able to analyze and manipulate exams as if the images were still on the ultrasound system. In addition, DICOM images from other ultrasound systems can be easily viewed and analyzed without the need for screen calibration.

Functionality

Advanced Echo Stress

- Review of stress-echo studies acquired with the Vivid scanners[1] as well as other DICOM ultrasound systems
- User-definable groups
- Quantitative stress analysis of grayscale 2D and tissue velocity information raw data acquired in parallel on Vivid scanner
- Qualitative wall motion scoring
- Quantitative stress analysis provides three different analysis tools based on TVI data stored during stress acquisition:
  - Vpeak measurement: Enables the display of a tissue velocity trace for a selected region of a previously scored segment through the entire heart cycle
  - Tissue tracking: Enables visualization of the heart contraction at peak level by color coding the displacement in the myocardium
  - Quantitative analysis: Enables further quantitative analysis based on multiple tissue velocity traces
- Stress echo report templates

AFI Stress Echo

- Single or triplane acquisition of standard 2D apical views
- Analysis with dedicated AFI stress analysis tool
- Provides longitudinal strain values per segment, as well as globally
- Allows complete assessment at a glance by combining three longitudinal views into one comprehensive bulls-eye view
- Integrated into M&A package with specialized report templates
- Simplified workflow with adaptive ROI, quick tips and combine display of traces from all segments

Measurements and Analysis

- Personalized measurement protocols allow individual set and order of M&A items
- Measurements can be labeled seamlessly by using protocols or post assignments
- Measurements assignable to protocol capability
- Parameter annotation follow ASE standard
- Seamless data storage and report creation
- User-assignable parameters
- Comprehensive set of cardiac measurements and calculations to help assess dimensions, flow properties and other functional parameters of the heart
- Comprehensive set of shared service measurements and calculations covering vascular, abdominal, obstetrics and other application areas
- Configuration package to set up a customized set and sequence of measurements to use, defining user-defined measurements and changing settings for the factory-defined measurements
- Stress echo support allowing wall motion scoring and automatic stress level labeling of measurements
- Support for measuring DICOM images
- Automatic Doppler trace functionality for use in non-cardiac applications in both live and replay
- Cardiac Auto Doppler automatically provides Doppler measurement results for the most common parameters, with minimal user guidance

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1 *Vivid 7, Vivid i, Vivid iN, Vivid q, Vivid qN, Vivid iq, Vivid S5, Vivid S5N, Vivid S6, Vivid S6N, Vivid T8, Vivid T9, Vivid E7, Vivid E9, Vivid S60, Vivid S60N, Vivid S70, Vivid S70N, Vivid E80, Vivid E90 and Vivid E95*

- The AI Auto Measure - Spectrum Recognition feature enables automated recognition of the most common Doppler spectra and automatically starts the Auto Doppler measurement (where available). For those measurements not supported by Auto Doppler, the feature enables opening of the appropriate measurement folder for the recognized spectrum

- The AI Auto Measure - 2D feature enables automated quantification of the most common distance measurements performed on parasternal LAX 2D images. Minimal user guidance is required, but manual editing capabilities are supported

- Worksheet for review, edit and deletion of performed measurements

- Reporting support allowing a configurable set of measurements to be shown in the exam report

- DICOM SR export of measurement data

- Intima Media Thickness (IMT) measurements (option)
  - Automated measurement of IMT rather than measuring the IMT manually
  - Results representative of a region rather than a single point of a vessel wall
  - May help reduce examination time by automating the process of measuring the IMT

- 4D Auto LVQ, 4D LV Mass and 4D Strain (option)
  - Automated measurement of LV volume and EF from volumetric data
  - Automated identification of LV long-axis and standard views
  - Automated initialization of measurement ROI
  - Validation of detected boundaries
  - LV volume waveform for entire cardiac cycle
  - ED and ES automatically selected from volume waveform (max/min)
  - Approval of final results
  - Editing by point and click
  - Fully integrated in M&A system
  - Export of 4D strain trace and mesh data

- 4D Auto AVQ (option)
  - Automated alignment, segmentation and measurement of aortic annulus from volumetric data sets
  - Editing by point and click
  - User approval of final results
  - Fully integrated in M&A system with results in worksheet

- Quantitative analysis package
  - Traces for velocity or derived parameters (strain rate, strain, displacement) inside defined regions of interest as function of time
  - Contrast analysis with traces for grayscale intensity or angio power inside defined regions of interest as function of time, including post processing ECG triggering and curve fitting for wash in/wash out analysis
  - Curved anatomical M-mode display allowing an M-mode along an arbitrary curve in a 2D image

- Parametric imaging tool which gives quantitative data for global and segmental wall motion
  - Allows assessment at a glance by combining three longitudinal views into one comprehensive bulls-eye view
  - Integrated into M&A package with specialized report templates
  - 2D strain-based data moves into clinical practice
  - Intuitive workflow with adaptive and automated ROI, quick tips and combined display of traces from all segments

4D and Multi-dimensional Imaging (option)

- 4D views
  - Auto alignment to help define standard orientation of acquired 4D data
  - Standard views, such as 4ch, 2ch, APLAX, ME LAX, septum, mitral valve and aortic valve, are defined from the standard orientation
  - Automatic display of volume renderings and 2D cut planes from standard views

- 4D data cropping
  - Flexible tool for standard or dynamic cropping 4D data using up to six different crop planes
  - Each crop plane can be moved without any restrictions
  - The crop plane positions are visible in both the volume rendering and in the 2D cut plane displays

- 2 Click crop
  - Intuitive tool for visualization of 4D structures of standard and non-standard views

- Depth render
  - Volume visualization where the color hue changes according to the distance into the image
  - Depth Illumination map using shadowing effects to help enhance depth perception

- Stereo vision
  - 4D stereo vision is a display technique that enhances the perception of depth in 3D renderings. This is achieved by mixing two different volume renderings with slightly separated viewing angles and presenting them separately to the user's left and right eyes

- Multi-slice
  - 5, 7, 8 and 12 slice available in a combination of short-axis and long-axis views extracted from the 4D volume dataset

- FlexiSlice
  - Simultaneous display of three independent random slices
  - Four different layouts available (Default, biplane, LAX, SAX)
  - Ability to add distances for quantification purposes

- Laser lines
  - Colored lines displaying the origin/location of extracted 2D slices as overlays on the 4D rendered volume

- HD*live*™ (option)
  - Visualization providing enhanced display of anatomical structures using advanced shadowing techniques in combination with depth color maps

- FlexiLight (option)
  - FlexiLight provides a type of visualization intended to enhance depth perception of 3D objects on a 2D monitor, by use of advanced shadowing, reflection and shading algorithms in combination with depth rendering techniques. It allows positioning a light source behind the rendered tissue with the purpose of offering a photo-realistic back light illumination. Visualization is available both in live and replay modes and in multiple color maps.

- HD color (option)
  - HD color enhances the perception of 4D color when visualized on a 2D monitor by addition of shadowing and specular reflection techniques. In addition, it offers the ability to see turbulent velocity components inside the flow volume by use of transparency control

- 4D clarity
  - User-selectable, spatial filtering algorithm for noise reduction and smoothing both in 4D and in extracted 2D slices

- 4D markers (option)
  - 4D markers enable placement of annotations into a 4D volume data set
  - The markers are named and keep their position relative to the 4D data set
  - Editing available

Automated Function Imaging 3.0 (option)

- Third-generation parametric imaging tool which gives information about global and segmental strain

- User-selectable endo or full wall global strain values displayed

- Tri-plane AFI allows assessment at a glance by combining three longitudinal views into one comprehensive bulls-eye view

- AFI with TEE

- Integration into M&A package with specialized report templates

- Random sequence of analysis of the three views supported

- Ability to exit tool after one or two views completed

- Simplified workflow with new quick tips, and adaptive ROI to help provide robust and reproducible results – helps improve the speed and confidence in understanding the LV function

- ROI width editable by user

- Support for display of Ejection Fraction (EF) as part of this tool

- On-scanner automatic labelling of views during acquisition enabled by an intelligent algorithm called View Recognition, is used to simplify the AFI workflow eliminating the need to pick views

- Analysis of for adult TTE DICOM images from 3rd-party scanners is supported

AFI RV (optional)

- AFI RV is an automated parametric tool giving quantitative data for right ventricular longitudinal Global Strain, Free Wall Strain and Segmental Strain derived from raw data images of the apical 4-chamber RV focused view (TTE)

- In addition, the Tricuspid Annular Plane Systolic Excursion (TAPSE) is provided

- The 3-point click method is used for ROI selection.

- The tool supports ROI editing of both endo- and epicardial borders as well as selectable full wall/endocardial strain calculation

- Combined display of traces from all segments

AFI LA (optional)

- Parametric tool giving quantitative data from GE raw data images for left atrial longitudinal global strain as well as LA volumes and Emptying Fraction derived from the apical 4-chamber and 2-chamber views (TTE)

- The 3-point click method is used for ROI selection

- Full wall tracking is utilized

Peak Strain Dispersion (PSD)

Index as well as bulls-eye displaying variability in time to peak longitudinal strain. The index is the standard deviation from the average (of all segments) over the whole heart cycle, while the bulls-eye displays the PSD in a color scheme where green color indicates normal contraction with a peak at or around AVC, blue color indicates early contraction and yellow to red indicates late contraction.

Auto EF 3.0 (option)

- Third-generation automated 2D EF measurement tool based upon a 2D-speckle tracking algorithm

- Compared to the previous version ROI editing is enhanced

- The tool is integrated into the M&A package with specialized report templates.

- On-scanner automatic labelling of views during acquisition enabled by an intelligent algorithm called View Recognition, is used to simplify the AFI workflow eliminating the need to pick views

Myocardial Work (option)

- Builds upon the results from AFI or 2D Strain

- After adding the external blood cuff pressure and event timing for each AV/MV valve opening/closure a strain pressure curve, a work index and a work efficiency percentage is produced

- May reduce the load dependency experienced when measuring longitudinal strain, and as such provide more accurate and reproducible results, important especially for follow-up of patients over time

Advanced Q-Scan with
Tissue Synchronization Imaging (option)

- 2D strain and strain rate imaging which gives information about synchronicity of myocardial motion

- Delayed myocardial segments produce red overlay whereas segments with early motion are green

- Additional features in combination with multi-dimensional imaging option
  - Efficient segment specific TSI time measurements
  - Immediate bulls-eye report
  - Automatic calculated TSI synchrony indexes
  - TSI surface mapping
  - LV synchronization report template

Z Scores

Support for five sets of user-selectable Z score publications[2] covering the most common pediatric dimension measurements.

IMT (option)

The IMT option provides automatic measurement of Intima Media Thickness of the carotid artery. The algorithm works with TruScan raw data images from GE Vivid family of ultrasound scanners.

2D Strain (option)

2D strain is an advanced option on EchoPAC Software Only allowing global and regional quantitative evaluation of the myocardial function. 2D strain enables calculation of myocardial tissue velocity and deformation parameters based on feature tracking from 2D grayscale and/or 2D tissue Doppler (TVI) images.

Multi-layered 2D strain shows strain values from endocardial, mid as well as epicardial layers. Width of ROI can be adjusted to fit individual differences in segment thickness. Time caliper tool is provided for ease of quantifying time differences.

The torsion screen displays the global torsion and torsion rate. The torsion is calculated as the difference between the apical and basal rotations and is available when apical short-axis (SAX-AP) and mitral valve short-axis (SAX-MV) views have been processed.

2 Michael D. Pettersen, MD; Wei Du, PhD; Mary Ellen Skeens, MS; and Richard A. Humes, MD; Detroit, Michigan; and Andover, Massachusetts. *Regression Equations for Calculation of Z Scores of Cardiac Structures in a Large Cohort of Healthy Infants, Children, and Adolescents: An Echocardiographic Study. Journal of the American Society of Echocardiography* Pettersen et al. 923 Volume 21 Number 8.

C Kampmann, C M Wiethoff, A Wenzel, et. al. *Normal Values of M Mode Echocardiographic Measurements of More Than 2000 Healthy Infants and Children in Central Europe. Heart* 2000; 83; 667-672.

M Cantinotti, MD; M Scalese, MS; B Murzi, MD; et. al. *Echocardiographic Nomograms for Chamber Diameters and Areas in Caucasian Children. Journal of American Society of Echocardiography* December 2014; Volume 27, Issue 12; 1279-1292.e2.

M Cantinotti, MD; M Scalese, MS; B Murzi, MD; et. al. *Echocardiographic Nomograms for Ventricular, Valvular and Arterial Dimensions in Caucasian Children with a Special Focus on Neonates, Infants and Toddlers. Journal of American Society of Echocardiography* February 2014; Volume 27, Issue 2; 179-191.e2.

Lopez L et. al. *Relationship of Echocardiographic Z Scores Adjusted for Body Surface Area to Age, Sex, Race, and Ethnicity. The Pediatric Heart Network Normal Echocardiogram Database. Circ Cardiovasc Imaging.* 2017 ov; 10(11). pii: e006979. doi: 10.1161/CIRCIMAGING.117.006979.

BEI Xia, *Pediatric Ultrasound Imaging.* Beijing: People's Medical Publishing House, 2013 (Second Edition): 173-227.

BEI Xia, *Pediatric Ultrasound Imaging.* Beijing: People's Medical Publishing House, 2013 (Second Edition): 261-289.

Peak Strain Dispersion (PSD) – index as well as bulls-eye displaying variability in time to peak longitudinal strain. The index is the standard deviation from the average (of all segments) over the whole heart cycle, while the bulls-eye displays the PSD in a color scheme where green color indicates normal contraction with a peak at or around AVC, blue color indicates early contraction and yellow to red indicates late contraction.

4D Auto RVQ (option)

GE's fully integrated semiautomated right ventricular quantification package offers the ability to visualize the right ventricle and include quantitative results into the patient exam.

4D Auto MVQ (option)

GE's fully integrated semiautomated mitral valve quantification package offers the ability to visualize the mitral valve and include quantitative results into the patient exam.

4D Auto LAQ (option)

GE's fully integrated semi-automated left atrial quantification package offers the ability to visualize and quantify the left atrium volumes, ejection fraction and strain. The tool supports images acquired with the 4D TTE probes.

4D Auto TVQ

GE's fully integrated semiautomated tricuspid valve quantification package offers the ability to visualize the tricuspid valve and include quantitative results into the patient exam. The tool is for use on data sets from adults, both with TTE and TEE 4D probes.

Image Review

- TruScan architecture allows for instant access/recall to digital raw data for analysis and reporting

- EchoPAC Software Only image browser displays from current and stored exams for efficient serial image review

- Thumbnail image display for quick overview

- Image play, freeze and single frame advance are possible in the image review screen

- Flexible image layout with multiple images allows for serial comparison of image data from different exam dates (up to 12 images single frames and cine loops)

- User manual available on-line through "Help" button

Image Post Processing

GE raw data enables "scanner" post-processing functionality:

- Anatomical M-mode

- Compress/reject

- Gain

- Cine speed adjustment

- Freeze/unfreeze

- Frame-by-frame review of cine loops

- Up/down and invert

- Zoom and pan facility

- Tint

- Color map selection

- DDP control

- Color display on/off

- Horizontal sweep adjustment

- Baseline shift

- Physiological traces control (gain and position)

- Tissue priority

- Variance

Workflow/Productivity/Connectivity

- Digital raw data (single frames and cineloop of 2D, 4D, M-mode, TVI, Spectral and Color Doppler modalities) enables image review at the original resolution and frame rate from the Vivid scanners[1]

Note: *Images with Compound and Virtual Convex from from Vivid i, Vivid iN, Vivid q, Vivid qN, Vivid S5, Vivid S5N, Vivid S6, Vivid S6N not supported.*

- DICOM media read (CD, DVD, MOD, USB drive)

- ECG, phono and three auxiliary traces recorded with raw data capture

- EchoPAC Software Only creates MPEG image files and attaches a MPEG viewer to enable physicians and sonographers to view images on conventional PCs

- Quality Image sets can be copied and saved on to removable media (CD, DVD, USB flash card) by EchoPAC for DICOM media interchange, as well as MPEG, JPEG, VolDICOM and AVI formats

- EchoPAC Share (option) enabling up to four GE clients (Vivid scanners or other EchoPACs)[1] to simultaneously connect to the patient archive of the master EchoPAC Software Only acting as "mini server"

Patient Record and Image Management

- Shared patient archive for the Vivid scanners[1]

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- Exceptional workflow with instant access data management

- Fast search and recall of patient studies

- Physicians can search on their name and patient file to view if a report has been completed or not with one click

- Stress, pediatric, vascular and many other exam categories can be searched with one click

- Functionality to sign a report. User is prompted for username/password. Sign-off is clearly indicated and by whom and date/time in the patient management screens and report screen. The signed report can only be changed by a user with the appropriate authorizations. The "Diagnosing Physician" field is automatically assigned to the user that did the sign-off.

- Patient browser screen for registration of demographic data and quick review of image clipboard contents

- Storage of single-frame, multi-frame and raw data image in raw data DICOM format

- DICOM media store (US, US-MF and secondary capture) to CD, DVD and USB drive

- DICOM network storage to DICOM server

- Storage of reports (internally and via Save As) and worksheet

- Export of reports as CHM, TEXT and PDF formats

- Export of measurements and findings in XML format

- Export of 4D datasets to media or shared network volume, in a data format ("VolDicom") that can be imported and analyzed by TomTec's® workstation or other 3rd-party devices that can process this format

- Report-structured text statements assist in quickly creating reports

- Report function includes: Patient information, measurements, calculations, ultrasound images and wall motion scoring

- Pre-defined clinical report templates for cardiac, vascular, general imaging and OB

- Configurable report templates

- Structured findings report tools support efficient text entries with direct editing of findings text, usability enhancements, new configuration options and conclusion section

- Pre-defined and configurable structured findings for efficient generation of the echo study findings – the findings will populate the final report

- Pre-defined structured findings for vascular and pediatric applications

- Normal values: Each measurement can be given a normal range and measurements in the report falling outside the normal range will be highlighted

- Printable on ink-jet printer and laser printer

- Report and view images and measurements at the same time

- Measurements created on the Vivid ultrasound system automatically populate the EchoPAC worksheet

- Measurements created on ultrasound systems other than Vivid are manually entered into the EchoPAC worksheet

- EchoPAC worksheet measurements selected by the physician and sonographer auto populate the EchoPAC report

- Use of USB storage devices or network attached storage devices (NAS), as long-term image storage by use of the "Disk Management" function

- Use of USB storage devices, such as USB flash cards and USB hard disks, for archive/raw data export and import

- Activity report for ICAEL accreditation: Report out echo-lab activity for a specified period of time, in CHM, TEXT or PDF format – contains information about which operator, type of exam, etc.

DICOM

- Storage

- Read/write images on DICOM format (US, US-MF and Secondary Capture)

- Storage Commit (SC)

- Query/retrieve

- DICOM print

- DICOM SR creation

Ease of Use

Measurements from the Vivid scanners[1] populate the EchoPAC report from the EchoPAC worksheet. Physicians decide which measurements will be displayed on the final report. The sonographer or physicians on the fly can customize templates for echo, vascular and stress reports without system programming experts.

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Operating System and Hardware

Table 1 – EchoPAC Software Only Hardware Recommendations

GE recommends that you match or exceed this hardware configuration. This configuration required for full, specified 4D and volume operation.

Operating System	Windows 10 Pro (64 bit), Windows 10 Enterprise (64 bit). Note regarding Windows N/KN editions: If EchoPAC Software Only is to run on Windows 10 N or KN editions, the "Media Feature Pack of Windows 10" must be downloaded and installed prior to running EchoPAC Software Only.
CPU	2 GHz Intel® Core i-series CPU or better. (An Intel CPU with SSE4.2 and AVX support is required for AI-assisted features. Note that speed of AI assistance within EchoPAC will also depend heavily on the actual system load of other applications than EchoPAC.)
Memory	4 GB minimum
Screen Resolution	Minimum 32 bit, 1280 x 900 and maximum 1920 x 1200 • Recommended display scaling: Normal size (W10: 100%) • Please restart EchoPAC if computer screen resolution is changed while EchoPAC is running
Available Disk Space	Program: • 2 GB (minimum) for programs on C drive • Minimum 3 GB additional disk space for patient/image archive Patient study storage: Examples of typical study sizes and the resultant number of patient studies per GB are shown below. • Vivid raw data study (75 MB/study) – 12 patient studies per 1 GB[3] • Vivid raw data study (100 MB/study) – 10 patient studies per 1 GB[3] • Vivid raw data study (125 MB/study) – 8 patient studies per 1 GB[3] [3] *Storage space required for patient study storage will vary depending upon procedure type, probe type, Vivid type, and the operator usage patterns employed for the procedure. Overall storage capacity must also account for other content on the hard drive of the target PC. The study sizes shown above are representative sizes only.*
USB	Required to have at least one port available.

Graphics Controller	Performance will vary depending on the graphics capabilities of your graphics board. Many laptop/notebooks have integrated graphics chips that are not suited for high-performance 2D and 3D graphics display. To achieve full 4D operation of the EchoPAC Software Only workstation including dynamic 9 slice, an NVIDIA® graphics board with support for CUDA® is required, as well as an NVIDIA driver with CUDA 2.3 support. Performance of an EchoPAC Software Only workstation, including full 4D functionality, will depend on a number of factors such as processing speed, graphics board capabilities, available memory space and general operating environment.
	
	All 3rd, 4th and 5th generation Core CPUs from Intel with integrated GPUs are DirectX11® compliant.
	
	Discrete DirectX11 compliant GPUs:
	
	• NVIDIA Quadro K1200 and above; Quadro M2000, M4000 and above; Quadro M1000M mobile GPUs and above; Quadro P600, P1000 and above (both desktop and mobile)
	
	• For a complete list of DirectX11 compliant NVIDIA GPUs:
	
	  - https://www.nvidia.com/en-us/design-visualization/previous-quadro-desktop-gpus/
	
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	• AMD FirePro W5000, W5100 and above; AMD Radeon Pro WX2100, WX3100 and above

Table 1 – EchoPAC Software Only Hardware Recommendations *(continued)*

Other Considerations	Required software:
	• Windows Media Player® 9.0 or higher
	• Adobe® Acrobat® Reader (for on-line Help function)
	• Internet Explorer® 11 or higher

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• Internet Explorer® 11 or higher

No versions of Sybase® database may be installed on the target PC prior to installation of EchoPAC Software Only.

If Oracle® database is already installed and used by other applications on the target PC, a conflict may result, causing the EchoPAC Software Only not to operate properly.

The hardware key ("dongle") must be inserted at all times for proper operation of the EchoPAC Software Only.

The installation of EchoPAC Software should run from the UFD. You must be logged in with Administrator rights to install the application.

The length of the Computer Name can be a maximum of 15 characters.

If you have a SCSI device that you want to use for storage, it is required that the Windows user account has Administration rights.

Using dataflows that involves remote connection, the Network security setting "Lan Manager authentication level" must be set to one of the following setting:

• Send LM and NTLM responses

• Send LM and NTLM – use NTLMv2 session security if negotiated

• Send NTLM response only

Running EchoPAC Software Only via Remote Desktop (or similar systems, Citrix, VNC, etc.) is not supported.

Running EchoPAC Software Only on a Virtual Machine is not supported.

EchoPACs configured as EchoPAC Share and being connected to Vivid E9 113.1.[4] or older scanners, must have SMBv1 enabled in Windows. Otherwise the Vivid scanner will not be able to access the remote archive on the EchoPAC Share.

MS .NET 2.0 Framework is required. This feature comes with .NET 3.5 which is not in Windows 10. For Windows 10 this feature must manually be enabled from Control Panel – Programs and Features.

[4] ***Warnings:***

Two users will automatically be created during installation: EchoClient and E1c2h3o4C5l6i7e8n9t. These users are needed to be able to connect Vivid scanners or EchoPAC to LocalArchive.

The folder that you select as archive destination will automatically be shared with the sharename "Archive." This folder is shared with full access for the new users: EchoClient and E1c2h3o4C5l6i7e8n9t.

If you have currently any folders already shared with name "Archive," that sharing will be stopped.

If Nvidia nView Desktop Manager is installed, this application must be disabled when running EchoPAC.

Table 1 – EchoPAC Software Only Hardware Recommendations *(continued)*

Other Considerations *(continued)*	Windows N/KN editions:
	If EchoPAC Software Only is to run on Windows 10 N or KN editions, the "Media Feature Pack for N and KN version of Windows 10" must be downloaded and installed prior to running EchoPAC Software Only.
	It has been observed that Help/User Manual fails to open, on some SW-configurations. This can be solved by following this Workaround:
	• Start Adobe Reader
	• Enter Edit -> Preferences -> Security (Enhanced)
	• Uncheck "Enable Protected Mode at startup"
	Please note:
	This product has not been validated for all combinations of hardware and software platforms.

Table 2 – EchoPAC Software Only

Minimum requirements for the hardware. Not appropriate for full, specified 4D and volume operation.

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CPU	2 GHz Intel Core i-series CPU or better. (An Intel CPU with SSE4.2 and AVX support is required for AI-assisted features. Note that speed of AI assistance within EchoPAC will also depend heavily on the actual system load of other applications than EchoPAC.)
Memory	2 GB minimum
Screen Resolution	Minimum 32 bit, 1280 x 900 and maximum 1920 x 1200 • Recommended display scaling: Normal size (W10: 100%) • Please restart EchoPAC if computer screen resolution is changed while EchoPAC is running
Available Disk Space	Program: • 2 GB (minimum) for programs on C drive • Minimum 3 GB additional disk space for patient/image archive Patient study storage: Examples of typical study sizes and the resultant number of patient studies per GB are shown below. • Vivid raw data study (75 MB/study) – 12 patient studies per 1 GB[3] • Vivid raw data study (100 MB/study) – 10 patient studies per 1 GB[3] • Vivid raw data study (125 MB/study) – 8 patient studies per 1 GB[3] 3 *Storage space required for patient study storage will vary depending upon procedure type, probe type, Vivid type, and the operator usage patterns employed for the procedure. Overall storage capacity must also account for other content on the hard drive of the target PC. The study sizes shown above are representative sizes only.*
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Graphics Controller	Performance will vary depending on the graphics capabilities of your graphics board. Many laptop/Notebooks have integrated graphics chips that are not suited for high-performance 2D and 3D graphics display.
	
	All 3rd, 4th and 5th generation Core CPUs from Intel with integrated GPUs are DirectX11 compliant.
	
	Discrete DirectX11 compliant GPUs:
	
	• NVIDIA Quadro K1200 and above; Quadro M2000, M4000 and above; Quadro M1000M mobile GPUs and above; Quadro P600, P1000 and above (both desktop and mobile)
	
	• For a complete list of DirectX11 compliant NVIDIA GPUs:
	  - https://www.nvidia.com/en-us/design-visualization/previous-quadro-desktop-gpus/
	  - https://www.nvidia.com/en-us/design-visualization/quadro-desktop-gpus/
	
	• AMD FirePro W5000, W5100 and above; AMD Radeon Pro WX2100, WX3100 and above

Table 2 – EchoPAC Software Only *(continued)*

Other Considerations	Required software:
	• Windows Media Player 9.0 or higher
	• Adobe Acrobat Reader (for on-line Help function)
	• Internet Explorer 11 or higher
	No versions of Sybase database may be installed on the target PC prior to installation of EchoPAC Software Only.
	If Oracle database is already installed and used by other applications on the target PC, a conflict may result, causing the EchoPAC Software Only not to operate properly.
	The hardware key ("dongle") must be inserted at all times for proper operation of the EchoPAC Software Only.
	If running on a multiple monitor setup (with a host application on one monitor and Plug-in on another), the same resolution should be used for all monitors.
	The installation of EchoPAC Software Only should run from the UFD. Network installation of the software is not supported. You must be logged in with Administrator rights to install the application.
	If you have a SCSI device that you want to use for storage, it is required that the Windows user account has Administration rights.
	Running EchoPAC Software Only via Remote Desktop (or similar systems, Citrix, VNC, etc.) is not supported.
	Running EchoPAC Software Only on a Virtual Machine is not supported.
	EchoPACs configured as EchoPAC Share and being connected to Vivid E9 113.1.[4] or older scanners, must have SMBv1 enabled in Windows. Otherwise the Vivid scanner will not be able to access the remote archive on the EchoPAC Share.
	MS .NET 2.0 Framework is required. This feature comes with .NET 3.5 which is not included in Windows 10. For Windows 10 this feature must manually be enabled from Control Panel – Programs and Features.

[4] ***Warnings:***

Two users will automatically be created during installation: EchoClient and E1c2h3o4C5l6i7e8n9t.
These users are needed to be able to connect Vivid scanners or EchoPAC to LocalArchive.

The folder that you select as archive destination will automatically be shared with the sharename "Archive."
This folder is shared with full access for the new users: EchoClient and E1c2h3o4C5l6i7e8n9t.

If you have currently any folders already shared with name "Archive," that sharing will be stopped.

If Nvidia nView Desktop Manager is installed, this application must be disabled when running EchoPAC.

Table 2 – EchoPAC Software Only *(continued)*

Other Considerations *(continued)*	Windows N/KN editions: If EchoPAC Software Only is to run on Windows 10 N or KN editions, the "Media Feature Pack for N and KN version of Windows 10" must be downloaded and installed prior to running EchoPAC Software Only. It has been observed that Help/User Manual fails to open, on some SW-configurations. This can be solved by following this Workaround: • Start Adobe Reader • Enter Edit -> Preferences -> Security (Enhanced) • Uncheck "Enable Protected Mode at startup" ***Please note:*** *This product has not been validated for all combinations of hardware and software platforms.*

About GE Healthcare

GE Healthcare is a leading global medical technology and digital solutions innovator. GE Healthcare enables clinicians to make faster, more informed decisions through intelligent devices, diagnostic pharmaceuticals, data analytics, applications and services, supported by its Edison intelligence platform. With over 100 years of healthcare industry experience and around 50,000 employees globally, the company operates at the center of an ecosystem working toward precision health, digitizing healthcare, helping drive productivity and improve outcomes for patients, providers, health systems and researchers around the world. Follow us on Facebook.com, LinkedIn.com, Twitter.com and Insights.com or visit our website www.gehealthcare.com for more information.

GE Healthcare
9900 Innovation Drive
Wauwatosa, WI 53226
U.S.A.

www.gehealthcare.com