



VGiNLINE

System Requirements

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VGinLINE is a very flexible software product developed to perform fully automated analyses and evaluations on CT data sets. It can be used for batch processing, e.g., small batch series testing in quality labs or at service providers, as well as for fully automated processing in a production environment.

FEATURE	DESCRIPTION
Product name	VGinLINE
Release	3.2
Document ID	SystemRequirements-119-v001-002-en

TABLE 1-1: PRODUCT DETAILS



Except for the operating system and the display resolution, the following system requirements apply to the VGinLINE Worker computers, not to the VGinLINE Controller and/or Viewer computers.

OPERATING SYSTEM

The software has been tested and approved for the following operating systems:

APPLICATION	OPERATING SYSTEM	
	MINIMUM	RECOMMENDED
VGinLINE WORKER	Windows 7 Professional SP1 64 bit Windows 8.1 Professional 64 bit Windows 10 Professional 64 bit	
VGinLINE CONTROLLER, VGinLINE VIEWER	Windows 7 Professional SP1 32 bit Windows 8.1 Professional 32 bit Windows 10 Professional 32 bit	Windows 7 Professional SP1 64 bit Windows 8.1 Professional 64 bit Windows 10 Professional 64 bit
VGinLINE APPROVER	Windows 7 Professional SP1 64 bit Windows 8.1 Professional 64 bit Windows 10 Professional 64 bit	

TABLE 2-1: SUPPORTED OPERATING SYSTEMS

VGinLINE APPROVER requires a web browser. The recommended web browser is Google Chrome.

PROCESSOR

- Minimum:
Intel® Core™2 Penryn, Intel® Core™ i, or AMD Bulldozer.
- Recommended:
Latest Intel or AMD multi-core processors, e.g., Intel® Core™ i7 or Xeon® E5 processors with 2.4 GHz or higher.

RAM

- Minimum:

VGinLINE requires a minimum of 4 GB memory. However, the actual main memory needed for creating or loading a complete project will usually be significantly higher since it depends on the size of the data set and on the analyses to be performed:

- For visualization, main memory should be twice the size of the data set. If a project contains more than one data set, double the sum of the data set sizes.
- Performing analyses, segmentation, surface determination and other operations requires additional memory.
- Performing advanced analyses such as transport phenomena or structural mechanics simulations requires a minimum of 20 GB.
- Please make use of our evaluation version of the software to test with your typical data sets and analyses. Contact our support team during the evaluation phase in case any questions arise.

■ Recommended for professional use:

- Data set with 1024 slice images. Slice image with 1024 x 1024 pixels. $1024^3 = 2$ GB of data
=> Visualization only: minimum 4 GB memory
=> Professional data analysis: 8 – 16 GB memory
- Data set with 2048 slice images. Slice image with 2048 x 2048 pixels. $2048^3 = 16$ GB of data
=> Visualization only: minimum 32 GB memory
=> Professional data analysis: 64 – 96 GB memory
- For performing advanced analyses such as transport phenomena or structural mechanics simulations, a memory of 50 GB or more is recommended.

GRAPHICS CARD

■ Minimum:

Dedicated NVIDIA or AMD graphics cards with at least 512 MB VRAM and OpenGL 3.3 support.

■ Recommended:

- NVIDIA® Quadro® K2000 or higher
- NVIDIA® GeForce GTX 770 or higher
- AMD FirePro™ 3D V5900
- AMD FirePro™ 3D V7900
- AMD Radeon™ HD 7950
- AMD Radeon™ HD 7970

■ Drivers tested by Volume Graphics:

- NVIDIA® Quadro® 2000: driver version 335.23 (for Windows 7)
- NVIDIA® Quadro® K2100M: driver version 332.50 (for Windows 7)
- NVIDIA® Quadro® K600: driver version 331.82 (for Windows 8.1)
- NVIDIA® Quadro® K620: driver version 340.66 (for Windows 7)
- NVIDIA® GeForce GTX 680: driver version 340.52 (for Windows 7)
- NVIDIA® GeForce GTX 970: driver version 344.75 (for Windows 7)
- NVIDIA® GeForce GTX 980: driver version 347.52 (for Windows 8.1)
- AMD FirePro™ D700: driver version 13.25 (for Windows 8.1)

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SYSTEM REQUIREMENTS DISPLAY

- AMD Radeon™ HD 7970: driver version 14.50 (for Windows 7)
- AMD Radeon™ R9 290X: driver version 13.25 (for Windows 7)
- AMD Radeon™ R9 M290X: driver version 14.20 (for Windows 7)

Onboard graphics chips are generally not recommended and should be thoroughly evaluated if no dedicated graphics card is available.

If your computer has more than one graphics card, make sure to switch off the SLI mode.

DISPLAY

The minimum recommended resolution is 1400 x 1050.

SWAP SPACE

The available swap space should have the same order of magnitude as the RAM. If available, we recommend to place the swap partition on an SSD.

DISK SPACE

Make sure to have sufficient free disk space in the directory for temporary files. If there is less than 1 GB available in this directory, a warning message will be issued. This message is also issued if this directory has been deleted.

USER RIGHTS

Make sure every user either has user or administrator rights. The license might not work when using guest accounts.

RECOMMENDED SETUP

Optimum for industrial usage is a PC with

- two current Intel® Xeon® processors and 32 GB RAM,
- 64-bit hardware,
- 64-bit operating system, and
- 64-bit version of VGiNLINE.



Virtual machines are not supported. VGiNLINE should be executed on a physical machine.

Depending on the intended use, VGiNLINE can be run as a distributed system in a network using network shares. In this case, performance is also dependent on network band width. Contact Volume Graphics if you need assistance in setting up a suitable network configuration.

THIRD PARTY SOFTWARE

The optional reporting functions using an Excel Add-In support the following Microsoft® Excel versions:

- Microsoft® Excel 15 (part of Microsoft® Office 2013)
- Microsoft® Excel 16 (part of Microsoft® Office 2016)



Microsoft® Office 365 versions are not supported.



Using the Excel Add-In for reporting is currently only supported for Windows.

The optional CT Reconstruction module places some specific requirements on the graphics card and RAM. For other system hardware, please refer to the general system requirements listed above. Make sure to turn off the Aero theme when performing a CT reconstruction under Windows 7/8.1 to achieve optimum system performance.

RAM

- Minimum:
 - 2 GB to run the reconstruction for very small data sets.
- Recommended:
 - At least 4 GB.

Calculate the optimal size of memory based on the size of the volume ($x * y * z$), the size of one projection ($x * y$), and the number of projections:

size of memory = (volume size * 4) + (projection size * number of projections * 4)

The result is the optimal size of memory in bytes. To convert to MB, divide by 1,000,000.

Example:

volume: $1024 * 1024 * 1024$

size of one projection: $1024 * 1024$

number of projections: 720

size of memory = $(1024 * 1024 * 1024 * 4) + (1024 * 1024 * 720 * 4) = 7,314,866,176$

This equates to 7,315 MB or 7.315 GB.

GRAPHICS CARD

- Minimum:
 - NVIDIA GeForce GTX 650 Ti or higher
 - NVIDIA Quadro K620 or higher
 - AMD FirePro V5900 or higher
 - AMD R7 360 or higher
- Recommended:
 - NVIDIA Quadro K5000M
 - NVIDIA GeForce GTX 780
 - NVIDIA GeForce GTX 980 Ti
 - NVIDIA GeForce GTX Titan X
 - AMD Radeon R9 390 X
- Drivers tested by Volume Graphics:
 - NVIDIA Quadro 6000: driver version 275.33 (for Windows 7)
 - NVIDIA GeForce GTX 780: driver version 355.82 (for Windows 7)
 - NVIDIA GeForce GTX Titan: driver version 313.93 (for Windows 7)
 - NVIDIA GeForce GTX 980: driver version 355.98 (for Windows 7)
 - NVIDIA GeForce GTX 1080: up to driver version 368.81 (for Windows 7)
 - AMD FirePro W9000: driver version 13.25 (for Windows 7)

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SYSTEM REQUIREMENTS FOR CT RECONSTRUCTION DISPLAY

- AMD FirePro W9100 32 GB: driver version 16.12.1 (for Windows 7)
- AMD FirePro W9100 32 GB: driver version 17.Q4/17.10.1730.1012-170804a-317 (for Windows 7)
- AMD Radeon HD 7970: driver version 14.50 (for Windows 7)
- AMD Radeon PRO WX7100: driver version 17.Q4/17.10.1730.1012-170804a-317 (for Windows 7)

It is not recommended to use different types of graphics cards in a system.

DISPLAY

If the performance of a CT reconstruction performed on the graphics card in a dual monitor setup seems to be slow, remove the second monitor and reboot the computer.

GRAPHICS CARD

- Make sure to have the latest driver version for your graphics card installed.
- Graphics card drivers for laptops available from the laptop manufacturer may be out of date. Check the graphics card manufacturer's website for the latest graphics card drivers.
- Onboard graphics chips are not recommended.
- Volume Graphics uses platform-independent, industry-standard APIs like OpenGL or OpenCL for GPU programming. Vendor-specific APIs like CUDA or DirectX are currently not supported.

RAM

- Do not deactivate the swap space. If more RAM is needed than available and there is no swap space, this may cause the system to crash.

The table below lists some common problems and their solutions.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTIONS
Rendering problems occur, e.g., the 3D window is not (correctly) displayed, saved images are faulty.	<ul style="list-style-type: none"> An outdated graphics card driver is installed. 	Download and install the latest driver for your graphics card.
	<ul style="list-style-type: none"> An onboard graphics card is installed. 	An onboard graphics card might be insufficient to run your VG product.
Only part of the 3D window is updated when moving an object.	No Aero theme is selected in Windows.	In the Personalization window of the Windows Control Panel , switch to an Aero theme.
The performance is low.	There is not enough RAM available due to other applications running at the same time.	Close all other applications when running VGINLINE.
The performance is extremely low with large data sets.	The size of the data sets exceeds the installed RAM, data are swapped on hard disk.	<ul style="list-style-type: none"> If possible, install more RAM. Reduce the size of the data set, e.g., using suitable import settings.
The application crashes when working with large data sets.	The size of the data sets exceeds the installed RAM, the swap space is not activated or too small.	<ul style="list-style-type: none"> Activate the swap space. Enlarge the size of the swap space to about the order of magnitude of the RAM. Install more RAM. Reduce the size of the data set, e.g., using suitable import settings.
The application crashes when saving large image stacks (NVIDIA graphics card).	There is an incorrect implementation of OpenGL in the graphics card driver.	<ul style="list-style-type: none"> In Preferences > General > Expert > Offscreen renderer settings in the Edit (for Windows/Linux) or VGINLINE menu (for Mac), deactivate the Use framebuffer object extension option. Download and install a more recent driver for your graphics card.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTIONS
On a notebook with two graphics cards: The application crashes before or while showing the splash screen.	Automatic switching between the graphics cards does not work properly.	Deactivate the onboard graphics card in the BIOS in order to use the dedicated graphics card of the notebook.
An installed codec is not visible in the codec selection when saving a .avi file.	<ul style="list-style-type: none"> The codec is not compatible with the selected settings of the avi. 	<ul style="list-style-type: none"> Change the settings for the .avi file, e.g., frame size, frame rate (fps). In many codecs, the width and height of the image must be a multiple of 2. Select a different codec.
	<ul style="list-style-type: none"> A 32-bit version instead of a 64-bit version of the codec is installed. 	<ul style="list-style-type: none"> Install the 64-bit version of this codec. Select a different codec.
The application crashes when trying to save an animation to a .avi file using a third-party codec package.	Most codecs are continuously being developed and are not always free of bugs.	<ul style="list-style-type: none"> Select a different codec of this codec package to save the animation to a .avi file. Use a different codec package. Render the animation as an uncompressed .avi file or an image stack and convert it to a compressed .avi file using a third-party software (e.g., VirtualDub).
The dongle manager does not resume working after the operating system returns from sleep mode.	Known problem of the dongle manager.	Remove the dongle and reboot the computer.
VGINLINE does not start for a user with administrator rights.	The message “Do you really want to run the program as administrator or elevated process?” was answered with No and the Never show this dialog again checkbox was checked.	Delete the <i>settings_vgin-line3.2.ini</i> file in the <i>C:\Users\ <user name>\AppData\ Roaming\Volume Graphics</i> directory.
Performance drops considerably or the application freezes during CT reconstruction of large data sets on a system equipped with an NVIDIA GeForce GTX 1080 graphics card.	The installed driver for the NVIDIA GeForce GTX 1080 graphics card is newer than 368.81.	Install an older graphics card driver.

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TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTIONS
Importing a CAD file format supported by the CAD Import or CAD with PMI Import add-on module fails on a computer with Windows 7 operating system.	SP1 of Windows 7 is not installed on the computer.	Install SP1 of Windows 7.

TABLE 5-1: TROUBLESHOOTING