



VGSTUDIO MAX

System Requirements

If you have any questions regarding our products and services, do not hesitate to contact us:

Europe, Australia, Latin America (without Mexico), Africa:

Volume Graphics GmbH, 69115 Heidelberg, Germany

Sales:

E-mail: sales@volumegraphics.com

Phone: +49 6221 73920 60

Support:

E-mail: support@volumegraphics.com

Phone: +49 6221 73920 80

Japan:

Volume Graphics Co., Ltd., Nagoya 464-0858, Japan

Sales:

E-mail: sales@volumegraphics.jp

Phone: +81 52 508 9682

Support:

E-mail: support@volumegraphics.jp

Phone: +81 50 5305 1829

North America (Canada, USA, Mexico):

Volume Graphics, Inc., Charlotte, NC 28217, USA

Sales:

E-mail: sales-us@volumegraphics.com

Phone: +1 704 248 7736

Support:

E-mail: support-us@volumegraphics.com

Phone: +1 704 248 7736

China, including Mainland China, Hongkong, Macao, and Taiwan:

Volume Graphics (Beijing) Technology Co., Ltd., Beijing 100600, China

Sales:

E-mail: sales@volumegraphics.cn

Phone: +86 10 8532 6305

Support:

E-mail: support@volumegraphics.cn

Phone: +86 10 8532 6305

Singapore and other parts of Asia (except China and Japan):

Volume Graphics Pte. Ltd., Singapore 068914

Sales:

E-mail: sales@volumegraphics.sg

Phone: +65 6665 0310

Support:

E-mail: support@volumegraphics.sg

Phone: +65 6665 0311

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VGSTUDIO MAX is a software package for the analysis and visualization of voxel data. It is used in a variety of application areas such as industrial CT, medical research, life sciences, animation, and many others.

TABLE 1-1: PRODUCT DETAILS

FEATURE	DESCRIPTION
Product name	VGSTUDIO MAX
Release	3.3
Optional modules ^a	<ul style="list-style-type: none"> • Porosity/Inclusion Analysis • Extended Porosity/Inclusion Analysis (Includes P 202/VW 50093 and P 201/VW 50097) • Coordinate Measurement • Nominal/Actual Comparison • Wall Thickness Analysis • Fiber Composite Material Analysis • Transport Phenomena Simulation • Foam/Powder Analysis • Structural Mechanics Simulation • Structural Mechanics Cluster Extension • Manufacturing Geometry Correction • Volume Meshing • CT Reconstruction (Cone Beam, Fan Beam, Parallel Beam) • IAR^{b,c} for CT Reconstruction • Special Algorithms (Helix, ART) for CT Reconstruction • CT Reconstruction (Planar) • CAD Import^{d,e} • CAD Import with PMI^{f,g}
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^a Available at surcharge. May not be part of your installation. Contact Volume Graphics for details.

^b Technology licensed from Fraunhofer EZRT 

^c Available for Windows operating systems only.

^d CAD translation technology supplied by Tech Soft 3D. Supported CAD formats are: CATIA V5 (up to V5-6 R2019 (R29)), Creo (up to 6.0). In beta status: CATIA V4 (up to 4.2.5), JT (up to 10.2), Pro/ENGINEER (up to 19.0), Unigraphics/NX (V11.0 to NX 12.0 and 1847), Solid Edge (V19–20, ST–ST10, 2019), SolidWorks (from 97 up to 2019).

^e Available for Windows operating systems only.

^f CAD translation technology supplied by Tech Soft 3D. PMI import is supported for CATIA V5 and Creo. In beta status also for Pro/ENGINEER and Unigraphics/NX.

^g Available for Windows operating systems only.

OPERATING SYSTEM

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

TABLE 2-1: SUPPORTED OPERATING SYSTEMS

PLATFORM	OPERATING SYSTEM
Windows:	Windows 7 Professional SP1 64 bit Windows 8.1 Professional 64 bit Windows 10 Professional 64 bit
Linux:	Ubuntu 18.04 LTS 64 bit
Mac:	macOS Mojave 10.14

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:
VGSTUDIO MAX 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.



Importing FARO point clouds requires graphics cards that support at least OpenGL 4.1.

- **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
 - AMD Radeon™ PRO WX 7100
- **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)
 - NVIDIA® GeForce® RTX 2080 Ti: driver version 419.35 (for Windows 7)
 - AMD FirePro™ D700: driver version 13.25 (for Windows 8.1)
 - 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 resolution is 1400 x 1050, the recommended resolution is 1920 x 1080.

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 (see **Preferences > General > Expert** in the **Edit** (for Windows/Linux) or **VGSTUDIO MAX** menu (for Mac)). 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 VGSTUDIO MAX.



Virtual machines are not supported. VGSTUDIO MAX should be executed on your local machine.

THIRD PARTY SOFTWARE

- Reporting via Excel
The optional reporting functions using an Excel Add-In support the following Microsoft® Excel versions:
 - Microsoft® Excel 15 (part of Microsoft® Office 2013), 32 bit
 - Microsoft® Excel 16 (part of Microsoft® Office 2016), 32 bit



64-bit versions of Microsoft® Excel are not supported.



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

- Floating licenses

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SYSTEM REQUIREMENTS THIRD PARTY SOFTWARE

Floating licenses need to be installed using the FlexNet Licensing Server. During installation of the FlexNet Licensing Server, Java Runtime Environment (64-bit version) 1.6 or later or OpenJDK 9 (64-bit version) is required, which is not part of the license or installation package.



The installation of the FlexNet Licensing Server requires a 64-bit version of Java Runtime Environment.

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)
 - NVIDIA® GeForce® RTX 2080 Ti: driver version 419.35 (for Windows 7)

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SYSTEM REQUIREMENTS FOR CT RECONSTRUCTION DISPLAY

- AMD FirePro™ W9000: driver version 13.25 (for Windows 7)
- 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.

GENERAL

- On starting the application, system resources such as main memory and number of processors are checked since these may be insufficient, especially if several applications are run at a time. If your system resources are not sufficient, a warning message will be displayed. Under certain conditions, starting the application may be prevented.
- You need a 3-button mouse with a scroll wheel to use the software. 3D mouse functionality is supported for the 3D window for 3DConnexion mouse devices.
- Problems may arise when running more than one instance of the application. Typical effects are, e.g., problems with the user interface, such as incomplete or misplaced interface elements or errors in the display of images. User settings like presets or workspace layout may inadvertently be overwritten. Processor capacity and main memory will be shared between instances of the application and may prove insufficient. This may result in a dramatically low system performance or even application crashes, especially if parts of the information need to be swapped to disk due to high memory consumption.

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

- For the calculation of the required RAM, only the size of the data set when loaded into the RAM is relevant. If the data is saved in compressed files, e.g., in the JPEG 2000 format (.jp2), the size of the data set on the hard disk may be significantly smaller than the size of the data set when loaded into the 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.

REMOTE ACCESS

Remote access to VGSTUDIO MAX is not supported. You should run the software locally on your own computer. If you use remote access to run VGSTUDIO MAX, you may encounter problems such as a corrupt display of the user interface, low performance, application crashes, and more.

The table below lists some common problems and their solutions.

TABLE 5-1: TROUBLESHOOTING

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.
	<ul style="list-style-type: none"> The installed graphics card is not recognized correctly. 	In Preferences > General > Expert > Hardware renderer in the Edit (for Windows/Linux) or VGSTUDIO MAX menu (for Mac), check the Memory override option and manually set the correct memory of your graphics card.
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 VGSTUDIO MAX.
The performance is extremely low with large data sets.	The size of the data sets exceeds the installed RAM, data is 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.	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.
When double-clicking a .vgl file in the Windows Explorer, it is not opened by VGSTUDIO MAX.	.vgl files are not linked to the executable of VGSTUDIO MAX.	Re-install the software.
VGSTUDIO MAX 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_vgstudio-max3.3.ini</i> file in the C:\Users\ <i><user name></i> \AppData\Roaming\Volume Graphics\ directory.

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TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTIONS
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.
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.
When installing the Flexera License Server, an error message related to Java appears.	A 32-bit version instead of a 64-bit version of Java Runtime Environment is used.	Install the 64-bit version of Java Runtime Environment 1.6 or later.