VGinLINE

System Requirements

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Introduction

VGinLINE is a very flexible software product developed to perform fully automated analyses and evaluations on CT data sets based on VGSTUDIO MAX functionality, including all modules and CT reconstruction. It can be used for batch processing, such as small batch series testing in quality labs or at service providers, as well as for fully automated processing in a production environment.

Table 1-1: Product details

Feature	Description
Product name	VGinLINE
Release	2024.1
Document ID	SystemRequirements-1038-v018-001-en

The software consists of several components:
> VGinLINE WORKER
> VGinLINE CONTROLLER
> VGinLINE VIEWER
> VGinLINE APPROVER

All computers belonging to the VGinLINE system must be connected via the same local network:
> The computers where VGinLINE WORKER runs
> The computer where VGinLINE CONTROLLER runs
> The computer where VGinLINE VIEWER runs
> The computer where VGinLINE APPROVER server and the web clients run
> The computer with the Workspace directory
> The computers with the input directories

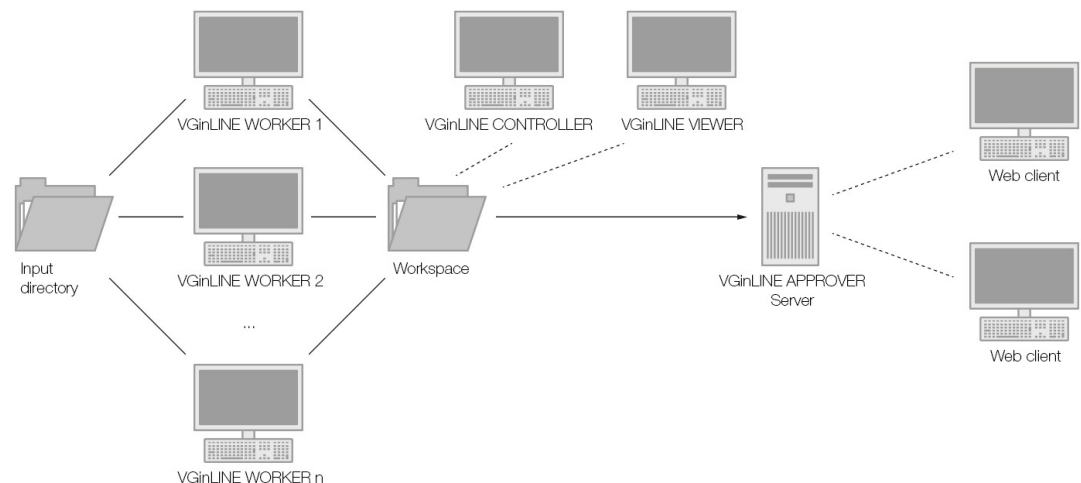All components of a VGinLINE system are synchronized via the Workspace:

Figure 1-1: Components of a VGinLINE system

In a minimal setup, VGinLINE WORKER, VGinLINE CONTROLLER, and—optionally—VGinLINE VIEWER and VGinLINE APPROVER can be installed on the same computer, which may also contain the Workspace directory as well as the input directories:
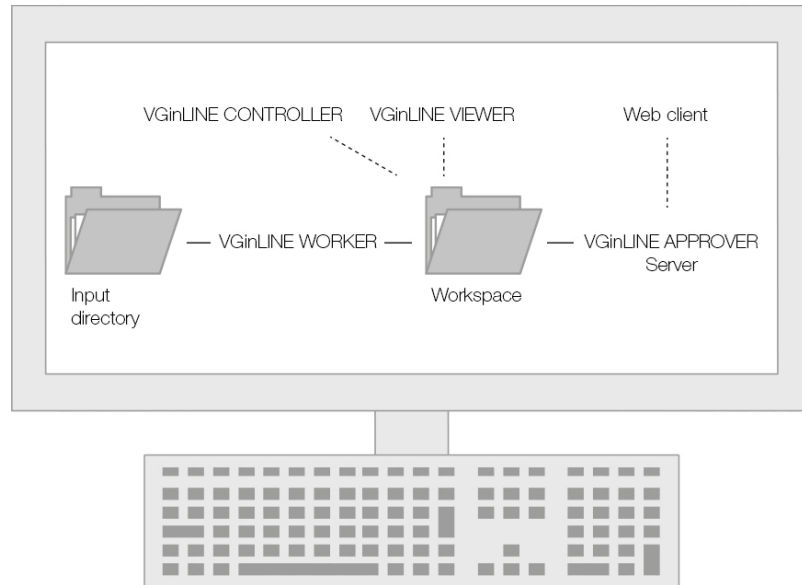

Figure 1-2: Minimal VGinLINE setup

System Requirements

The following system requirements basically apply to the VGinLINE WORKER computers. The sections *Operating System*, *Display*, *Disk Space*, and *Network* also apply to the VGinLINE CONTROLLER, VGinLINE VIEWER, and VGinLINE APPROVER computers. Apart from that, there are no special requirements for these software products; they can be run on common office computers.

Operating System

The software supports the following operating systems:

Table 2-1: Supported operating systems

Platform	Operating System
Windows:	Windows 10 Enterprise 64 bit
	Windows 10 Professional 64 bit
	Windows 11 Enterprise 64 bit
	Windows 11 Professional 64 bit

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

Processor

> Minimum:
>
> x86-64 CPU with instruction set SSE 4.1.

ARM processors are not supported.

> Recommended:
>
> Performant Intel or AMD multi-core processors, e.g., Intel® Core™ i7 or i9 or Xeon® Gold processors with 3 GHz or higher.

RAM

> Minimum:
>
> VGinLINE requires a minimum of 4 GB free memory. However, the actual free 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 the calculation of the required RAM, the size of the data set when it is loaded into the RAM is relevant. If the data is saved in compressed files (e.g., in 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 it is loaded into the RAM.
>
> > For visualization, the free 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 free memory.

> > Please make use of our evaluation license 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:

> > 16-bit data set with 1024 slice images. Slice image with 1024 x 1024 pixels. 1024^3 = 2 GB of data

> > => Visualization only: minimum 4 GB free memory

> > => Data analysis: 8–16 GB free memory

> > 16-bit data set with 2048 slice images. Slice image with 2048 x 2048 pixels. 2048^3 = 16 GB of data

> > => Visualization only: minimum 32 GB free memory

> > => Data analysis: 64–96 GB free memory

> > For performing advanced analyses, such as transport phenomena or structural mechanics simulations, a free memory of 50 GB or more is recommended.

> > Typical for industrial use with data set sizes as in the examples above (2 to 16 GB) is a PC with at least 64 (for one data set) to 512 GB RAM (for multiple data sets). Higher RAM clock speeds are recommended.

Graphics Card

> Minimum:

A dedicated NVIDIA or AMD graphics card with at least 2 GB VRAM, OpenGL 3.3 support, and—for Windows operating systems—the latest WHQL driver.

> Recommended:

A dedicated NVIDIA or AMD graphics card with at least 8 GB VRAM, OpenGL 4.1 support, and—for Windows operating systems—the latest WHQL driver.

Some functions, such as CT reconstruction (see chapter 3 *Recommendations for CT Reconstruction* on page 7), may benefit from increased graphics card performance. For details, please contact your local VG Support.

☞ Onboard graphics chips (integrated graphics processors) are not supported.

☞ Make sure to have the latest driver version for your graphics card installed.

Display

The minimum resolution is 1400 x 1050 at 100% scale; the recommended resolution is 1920 x 1080 at 100% scale.

The actual display resolution results from the display scale multiplied by the minimum resolution. This means that for a display scale of 200%, you should use a display resolution of at least 2800 x 2100.

VGinLINE supports 4K monitors.

Swap Space

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

Deactivating the swap space may cause the system to crash.

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.

Disk space requirements for VGinLINE are highly dependent on the way you use the system. The different components will sync using a common directory, the Workspace. Additionally, the data to be processed must be made available in the file system and shared with the different components. The space requirements depend on the results you create and the data you process.

Likewise, VGinLINE APPROVER will store its data in a folder in the file system. The space requirements depend on the size and amount of reports you put into this system. Note that VGinLINE APPROVER is not intended to indefinitely store data. When the database is too large, the application will slow down.

User Rights

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

Virtual Machines

Virtual machines are not supported. VGinLINE has to be executed on a physical computer.

Network

VGinLINE can be run as part of a distributed system in a network using network shares. In this case, performance may also be dependent on network band width.

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), 32 bit
> Microsoft® Excel 16 (part of Microsoft® Office 2016, Microsoft® Office 2019, Microsoft® Office 365, and Microsoft® Office 2021), 32 bit

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

☞ Using the Excel add-in for reporting is currently only supported for Windows.

Recommendations for CT Reconstruction

In addition to the above-mentioned requirements, the optional **CT Reconstruction** module places some specific requirements on the system.

RAM

> Minimum:
>
>   4 GB free memory to run the reconstruction for very small data sets.

> Recommended:
>
>   At least 128 GB free memory.

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: 2048 * 2048 * 2048

> size of one projection: 2048 * 2048

> number of projections: 3000

> size of memory = (2048 * 2048 * 2048 * 4) + (2048 * 2048 * 3000 * 4) = 84,691,386,368

This equates to 84,691 MB or 84.691 GB.

Graphics Card

CT reconstruction requires increased graphics card memory. If you are using more than one graphics card, it is recommended that all graphics cards are of the same type. For details, please contact your local VG Support.

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.

Troubleshooting

The table below lists some common problems and their solutions.

Table 4-1: Troubleshooting

Problem	Possible cause	Possible solutions
Rendering problems occur, e.g., the 3D window is not (correctly) displayed, saved images are faulty.	> An outdated graphics card driver is installed.	Download and install the latest driver for your graphics card.
	> An onboard graphics card is installed.	Onboard graphics cards are not supported. Deactivate the onboard graphics card in the BIOS in order to use the dedicated graphics card (if available).
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 is swapped on hard disk.	> If possible, install more RAM. > Reduce the size of the data set (for example, by 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.	> 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 (for example, by using suitable import settings).
The application crashes when you save 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.
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.

Problem	Possible cause	Possible solutions
An installed codec is not visible in the codec selection when saving a *.avi* file.	> The codec is not compatible with the selected settings of the avi.	> 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.
	> A 32-bit version instead of a 64-bit version of the codec is installed.	> Install the 64-bit version of this codec. > Select a different codec.
The application crashes when you try 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.	> 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).
When double-clicking a file in the Windows Explorer, it is not opened by VGinLINE.	files are not linked to the executable of VGinLINE.	Re-install the software.
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 *settings_vginline2024.1.ini* file in the *C:\ Users\<user name>\ AppData\Roaming\ Volume Graphics* directory.
VGinLINE is working locally but cannot be accessed remotely.		Contact your IT department to check your remote setup.