
Chapter 1: Installation Prerequisites for Windows

This document describes the steps necessary to correctly install and configure all ANSYS, Inc. products on Windows platforms for Release 2021 R1. These products include:

- ANSYS Discovery
 - ANSYS Discovery (includes SpaceClaim)
 - ANSYS Discovery SpaceClaim
- Electronics Reliability
 - ANSYS Sherlock
- ANSYS Explicit Dynamics
 - ANSYS Autodyn
 - ANSYS LS-DYNA
- ANSYS Fluid Dynamics
 - ANSYS CFD-Post only
 - ANSYS CFX (includes ANSYS CFD-Post)
 - ANSYS Chemkin
 - ANSYS Energico
 - ANSYS Model Fuel Library
 - ANSYS Reaction Workbench
 - ANSYS EnSight
 - ANSYS FENSAP-ICE
 - ANSYS Fluent (includes ANSYS CFD-Post)
 - ANSYS Forte
 - ANSYS TurboGrid
 - ANSYS Polyflow (includes ANSYS CFD-Post)
- ANSYS ICEM CFD

- ANSYS Offshore
 - ANSYS Aqwa
- ANSYS Optical
 - ANSYS SPEOS
 - ANSYS SPEOS HPC
- ANSYS Platform
 - ANSYS optiSLang
- ANSYS Structural Mechanics
 - ANSYS Customization Files
 - ANSYS Mechanical Products (includes ANSYS Mechanical and Mechanical APDL)
 - ANSYS Additive
- ANSYS Additional Tools
 - ANSYS Distributed Compute Services
 - ANSYS Icepak (includes ANSYS CFD-Post)
 - ANSYS Remote Solve Manager Standalone Services
 - ANSYS Viewer
- ANSYS Geometry Interfaces
 - AutoCAD
 - ACIS
 - CATIA, Version 4
 - CATIA, Version 5
 - CATIA, Version 6
 - Creo Elements/Direct Modeling
 - Creo Parametric
 - Inventor
 - JTOpen
 - NX
 - Parasolid

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- Solid Edge
 - SOLIDWORKS
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Note:

ANSYS Workbench is installed by default as product components to most ANSYS, Inc. products. ANSYS Workbench is not installed as part of the products under ANSYS Additional Tools, nor with the CFD-Post only option. ANSYS Workbench includes the following applications:

- The Mechanical Application
- DesignModeler
- Design Exploration
- Meshing
- Remote Solve Manager
- Fluent Meshing
- EKM Client
- GRANTA MI
- SpaceClaim Direct Modeler

Caution:

While **SpaceClaim Direct Modeler** and **ANSYS SpaceClaim** can be installed on the same computer, only one of the applications can be configured with ANSYS Workbench at any given time. Users can choose which version to configure via the CAD Configuration Manager utility.

Because some of these applications can be run as standalone applications without ANSYS Workbench, you will see some but not all of these listed separately as options when you uninstall. In such cases, you will need to select those options in order to uninstall those components.

Where supported, IGES and STEP Geometry Interfaces will be installed.

Some procedures apply only to specific products and are so noted.

Important Notice

If you want to run multiple releases of ANSYS, Inc. software, you **MUST** install them chronologically (for example., Release 2020 R2 followed by Release 2021 R1). If you install an earlier release after installing Release 2021 R1, you will encounter licensing issues that may prevent you from running any products/releases. If you need to install an earlier release after you have already installed Release 2021 R1, you **MUST** uninstall Release 2021 R1, then re-install the releases in order.

Summary of New and Changed Features

The following features are new or changed at Release 2021 R1. Review these items carefully.

- The ANSYS SPEOS HPC product has been added to the ANSYS installation program for Windows.
- The ability to enable ANSYS QA Services has been added to the ANSYS installation program for Windows.
- Microsoft MPI installation package has been added to the ANSYS installation program for Windows.
- The ANSYS GRANTA Selector has been added to the ANSYS Workbench installation.

1.1. System Prerequisites

ANSYS 2021 R1 is supported on the following Windows platforms and operating system levels. For up-to-date information on hardware platforms or operating systems that have been certified, see the [Platform Support section of the ANSYS Website](#).

Table 1.1: Supported Windows Platforms

Processor	Operating System	Platform architecture (directory name)	Availability
x64 (64-bit)	Windows 10 (Professional, Enterprise & Education), Windows Server 2016 Standard, Windows Server 2019 Standard	winx64	Download, USB
<p>Note:</p> <p>Home editions of Windows operating systems are not supported.</p>			
<p>For detailed and current support information, see the Platform Support section of the ANSYS Website.</p>			

Supported Products By Platform

For a complete list of products supported by each platform, see the **Platform Support by Application** PDF on the [Platform Support section of the ANSYS Website](#).

Supported Platforms for High Performance Computing

See the discussions on [Configuring Distributed ANSYS](#) and [Configuring ANSYS CFX Parallel](#) for detailed information on supported platforms for distributed computing.

1.1.1. CAD Support

The following CAD and auxiliary programs are supported on the indicated products and platforms (where the CAD product is supported on the noted platforms). Products are:

A = Mechanical APDL

W = ANSYS Workbench

I = ANSYS ICEM CFD (standalone and ANSYS Workbench Readers)

Table 1.2: CAD Support by Platform

Product	Windows 10 5
CATIA 4.2.4	A, W, I
CATIA V5–6R2020	A, W, I
CATIA V5 (CADNexus CAPRI CAE Gateway V3.70.0) V5–6R2018, V5–6R2019, V5–6R2020	W, I 2
CATIA V6 R2020x	W, I
Parasolid 30.0	A, W, I
Creo Parametric 7.0	A, W, I 3
Creo Parametric 6.0	A, W, I 8
Creo Parametric 5.0	A, W, I
ACIS 2020	A, W, I 1
NX 1872, 1899, 1926	A, W, I
NX 11.0 6	W
NX 12.0 6	W
SOLIDWORKS 2020	W, I
SOLIDWORKS 2019	W, I
SOLIDWORKS 2018	W, I
Solid Edge 2020	W, I
Solid Edge 2019	W, I
Inventor 2021	W, I
Inventor 2020	W, I 9
AutoCAD 2021	W, I
AutoCAD 2020	W, I 9
IGES 4	A, W, I
JT 10.5	W, I
STEP AP203, AP214, AP242	W, I
Creo Elements/Direct Modeling 20.3	W, I
Creo Elements/Direct Modeling 20.2	W, I
GEMS	I
IDI MS8/9	I
Rhinoceros 6.0	W, I
SketchUp 2020	W, I
SpaceClaim	

1. For ICEM CFD standalone, ACIS 18.0.1 is the supported version for all platforms.
2. Requires V5-6R2016 or later.

3. Requires Creo Parametric 2.0 M190.
4. IGES Versions 4.0, 5.2, and 5.3 are supported.
5. Professional, Education and Enterprise
6. Only supported by ANSYS SPEOS.
7. Requires operating system's SP1 Update KB4019990
8. Requires Creo Parametric 3.0 M060 or later.
9. Requires operating system's Anniversary Update version 1607 or higher
10. Requires operating system SP1.

Note:

View the latest supported CAD packages at [ansys.com> Solutions> Solutions by Role> IT Professionals> Platform Support> CAD Support](https://www.ansys.com/Solutions/Solutions%20by%20Role/IT%20Professionals/Platform%20Support/CAD%20Support).

1.2. Disk Space and Memory Requirements

You will need the disk space shown here for each product for installation and proper functioning. The numbers listed here are the maximum amount of disk space you will need for each ANSYS, Inc. product. Depending on the options selected for each product and shared product features, you may require less disk space when installing multiple products.

Product	Disk Space in GB
ANSYS Discovery	20.7
ANSYS Discovery SpaceClaim	17.9
ANSYS Sherlock	18.2
ANSYS Autodyn	18.3
ANSYS LS-DYNA	19.1
ANSYS CFD-Post only	18.3
ANSYS CFX	18.7
ANSYS Chemkin	19.3
ANSYS Energico	19.3
ANSYS Model Fuel Library (Encrypted)	19.3
ANSYS Reaction Workbench	19.3
ANSYS EnSight	21.4
ANSYS FENSAP-ICE	18.7
ANSYS Fluent	19.3
ANSYS Forte	22.3
ANSYS Polyflow	20.6

Product	Disk Space in GB
ANSYS TurboGrid	18.4
ANSYS ICEM CFD	18.4
ANSYS Aqwa	18.4
ANSYS SPEOS	23.2
ANSYS optiSLang	19.8
ANSYS Customization Files for User Programmable Features	22.1
ANSYS Mechanical Products	18.3
ANSYS Additive	20.1
Distributed Computing Services	17.9
ANSYS Icepak	19.8
ANSYS Remote Solve Manager Standalone Services	17.9
ANSYS SPEOS HPC	18.0
ANSYS Viewer	18.0
ANSYS Geometry Interfaces	18.2
Disk space required to install all products	43.2

Product installations also require an additional 500 MB of free disk space during an installation.

Memory Requirements

You must have a minimum of 8 GB of memory to run product installations; 16 or 32 GB of memory is recommended.

1.3. Software Prerequisites

You must have the following software installed on your system. Administrator privileges are required to install these files. These software prerequisites are installed automatically when you launch the product installation. If, after installing the ANSYS products, you need to check your system for these software prerequisites or re-install any of them at a later date, open the Product & CAD Configuration Manager and select **Check for Required Prerequisites** or **Install Required Prerequisites**.

- A minimum version of Microsoft .NET Framework 4.6.2 is required.

Note:

If your computer does not have Microsoft .NET Framework 4.6.2 installed, the installation program installs .NET 4.6.2 as a prerequisite and may require a system restart after exiting the installation and before running any ANSYS products.

- Microsoft .NET Framework 4.8 is required for ANSYS Discovery installation.
- Microsoft Visual C++ 2012 Redistributable (32 and 64 bit versions)
- Microsoft Visual C++ 2013 Redistributable (32 and 64 bit versions)

- Microsoft Visual C++ 2017 Redistributable (32 and 64 bit versions)

Prior to installing, you can find the executables for the software prerequisites in the root `\prereq` directory of the media/download package.

1.4. Requirements for the GPU Accelerator in Mechanical APDL

Your system must meet the following requirements to use the GPU accelerator capability in Mechanical APDL. For information on the most recently tested NVIDIA GPU cards, see the **GPU Accelerator Capabilities** PDF on the [Platform Support section of the ANSYS Website](#).

- The machine(s) being used for the simulation must contain at least one NVIDIA GPU card. The following cards are recommended:

- NVIDIA A100
- NVIDIA Tesla Series (any model)
- NVIDIA Quadro RTX 6000
- NVIDIA Quadro RTX 8000
- NVIDIA Quadro GV100
- NVIDIA Quadro GP100
- NVIDIA Quadro P6000
- NVIDIA Quadro P5000

- When using the sparse solver or eigensolvers based on the sparse direct solver (for example, Block Lanczos or subspace), only NVIDIA GPU devices with significant double precision performance (FP64) are recommended in order to achieve optimal performance. These include the following models:

- NVIDIA A100
- NVIDIA Tesla Series P100
- NVIDIA Tesla Series V100
- NVIDIA Quadro GV100
- NVIDIA Quadro GP100

- NVIDIA GPU devices with at least 16GB of on-card memory are recommended in order to achieve meaningful acceleration for most simulations in which the GPU card can be used.
- For NVIDIA GPU cards, the driver version must be 451.82 or newer. For optimal performance on Windows, the TCC (Tesla Compute Cluster) driver mode is recommended when using Tesla series GPU cards. Some limitations exist when using this driver mode. Check your GPU card documentation for more details on how to set this driver mode and the existing limitations.
- To utilize a NVIDIA GPU device that is not on the recommended list of cards, set the following environment variable:

`ANSGPU_OVERRIDE=1`

This is most beneficial when you wish to run on newer NVIDIA GPUs that were not available at the time of release of this version of the ANSYS program. If you choose to use this environment variable,

you should ensure that the NVIDIA GPU device that you wish to use is sufficiently powerful, in terms of both double-precision compute power and on-card memory, to achieve meaningful acceleration for your simulation. Using this environment variable with an underpowered CPU may actually decelerate your simulation.

Note:

On Windows, the use of Remote Desktop may disable the use of a GPU device. Launching Mechanical APDL through the ANSYS Remote Solve Manager (RSM) when RSM is installed as a service may also disable the use of a GPU. In these two scenarios, the GPU accelerator capability cannot be used. Using the TCC (Tesla Compute Cluster) driver mode, if applicable, can circumvent this restriction.

1.5. Additional Hardware and Software Requirements

- Intel 64 / AMD64 system with the correct operating system version installed
- 8 GB of RAM (Minimum)
- 128 GB free on the hard drive is recommended
- When using ANSYS SPEOS, we recommend: 32 GB of RAM per node, Intel Xeon processors with a high frequency at normal rate and 250 GB of SSD disk space.
- A current default web browser must be installed to view the **ANSYS internet-based help documentation**.

For a complete list of supported browsers, see the **Browser Support** PDF on the [Platform Support section of the ANSYS Website](#).

For a local copy of the product documentation on your system, download an installable version from the ANSYS Download Center. Instructions for installing the Local Help are included with the download package.

- Discrete graphics card with the latest drivers and compatible with the supported operating systems. For full functionality, use of a recent NVIDIA Quadro or AMD FirePro card with at least 1 GB of discrete video memory and supporting OpenGL version 4.5 or above. Intel Iris Pro Integrated graphics has also been used successfully.

For information on the most recently tested graphics cards, see the **Graphics Cards Tested** PDF on the [Platform Support section of the ANSYS Website](#).

For ANSYS Discovery, see [Product Installation](#)

Note:

- **Vendor Legacy Support:** To be compatible, legacy GL 4.5 compliant cards should still be within the official legacy support period of their respective graphics vendor, and must still be receiving regular driver updates. Visit the vendor websites ([AMD](#) and [NVIDIA](#)) to review legacy hardware lists.
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- A minimum screen resolution of: 1024 x 768 (4:3 aspect ratio), 1366 x 768 (16:9 aspect ratio) or 1280 x 800 (16:10 aspect ratio) with minimum 24 bit color. A higher screen resolution such as 1920x1080 (16:9) or 1920x1200 (16:10) is strongly recommended for most applications.

Note:

- Some combinations of graphics card type, operating system, and MPEG resolution fail to play MPEGs properly. You may be able to get normal playback results simply by changing the MPEG settings. Alternatively, you can upgrade your graphics card.
 - **Ultra High Definition (4K) Graphics Cards:** Use of Ultra High Definition (4K) graphics cards may cause a number of cosmetic display issues (including enlarged or reduced text and incorrect positioning of option labels). These issues do not affect the functionality of the installation program.
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- Microsoft Mouse or a mouse. Most applications require a three-button mouse.
- If you use a 3Dconnexion product, ensure that you have the latest version of the drivers installed.
- Approximately twice as much swap space as memory. The amount of memory swap space on the system may limit the size of the ANSYS model that can be created and/or solved.
- TCP/IP for the license manager (see the [ANSYS Licensing Guide](#) for more information on TCP/IP).

Although TCP/IP is included as part of the operating system, it may not be installed by default. When TCP/IP is installed, it must be bound to a network adapter. On machines that are connected to an internal network, TCP/IP must be bound to a network card such as an Ethernet adapter. The vast majority of systems using TCP/IP will fall into this category. On machines that connect to the internet or corporate intranet through a modem, TCP/IP can be bound to the Remote Access Service. Also, the Autodial option of the Internet Options must be disabled so that the machine does not attempt to connect to the Internet every time ANSYS is run. See the [ANSYS Licensing Guide](#) for more information.

- Microsoft Internet Explorer (IE) 11 or greater is recommended for proper operation of ANSYS Workbench. Once the correct version of IE is installed, it does not have to be your default Internet browser. After installation, simply run your preferred browser and reestablish it as the default.
- PDF reader software is required to read the installation guides and other user documentation.

To access our help system videos, ANSYS recommends that you set Windows Media Player as your default.

1.5.1. 3Dconnexion Product Support

Only specific ANSYS applications have been tested for manipulating the model (turning, zooming, panning, etc.) with the 3Dconnexion products. While these 3Dconnexion products do provide significantly enhanced 3D control over viewing the model, they do not function as a mouse replacement and selection operations still require a mouse. For a complete list of 3Dconnexion products certified with the current release of ANSYS applications, see the **3Dconnexion Devices Certification** PDF on the [Platform Support section of the ANSYS Website](#).

To use a 3Dconnexion product with the listed products, you must download and install the appropriate Microsoft Windows driver for your version of Windows. Refer to <http://www.3dconnexion.com> for more information on using Space products and to download the appropriate drivers.

Spaceball/Connexion3D functionality in ANSYS Discovery

- Only the "FIT" built in function is supported.
- Most of the other operations can be simulated by mapping Connexion functions to keyboard shortcuts supported in ANSYS Discovery.

1.5.2. ANSYS Additive Requirements

The ANSYS Additive application uses ports 5000, 7000, 7933, 7934, 7935, 8125, 8181, 9002, 9042, and 9711 to allow communication among the components in the application. See [ANSYS Additive will not start immediately after installation \(p. ?\)](#) to troubleshoot if these ports are not open.

All other requirements for Additive are the same as the default requirements for all ANSYS products.

1.5.3. ANSYS SPEOS Requirements

With the exception of the graphics adapter, the requirements for ANSYS SPEOS are the same as the default requirements for all other ANSYS products. ANSYS SPEOS requires a minimum NVIDIA Quadro P5200 graphics adapter with a 442.92 NVIDIA driver.

1.5.3.1. ANSYS Optical Labs Requirements

This page presents the hardware and software requirements of the ANSYS Optical Labs. The ANSYS Optical Labs are exclusively integrated in ANSYS SPEOS installation.

The workstation should meet or exceed the following requirements.

CPU

- Processor: Intel Pentium (or AMD equivalent)
- Memory: The required memory for ANSYS Optical Labs depends on each project. 2 GB is the minimum memory requirement but a project can require up to 32 GB for some applications (e.g. Visual Ergonomics).

Graphic Adapter

Only required for 3D Energy Density Lab and Virtual Reality Lab.

Table 1.3: 3D Energy Density Lab and Virtual Reality Lab Graphics

3D Energy Density Lab	Virtual Reality Lab
<ul style="list-style-type: none"> • NVIDIA graphics processor 	<ul style="list-style-type: none"> • AMD or NVIDIA graphics processor • Support of OpenCL 1.2 minimum

3D Energy Density Lab	Virtual Reality Lab
<ul style="list-style-type: none"> Support of OpenGL v2.1 minimum 	<ul style="list-style-type: none"> Support of OpenGL v2.1 minimum <p>SDK OpenCL is not required for GPU since it is included with the drivers.</p> <p>Active Stereoscopy can only be done on QUADRO and FIREPRO cards.</p>

GPU

AMD Radeon Pro Vega 56 with the latest driver version

NVIDIA

- Geforce: GTX 480 / GTX 680 or higher for VR Lab
- Quadro: FX 5600 / K5000 or higher for VR Lab
- 442.92 driver

Note:

- If you need to downgrade driver versions, uninstall the current driver versions first before installing the certified driver versions.
 - Because of the current OpenCL limitation on GPU, the maximum usable memory is limited to 4 GB for NVIDIA.
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Additional VR Lab Requirements

Examples of OptisVR Files Memory Requirements

This table contains a list of characteristics associated to OptisVR files and the corresponding GPU memory required for a correct display.

The following examples are for a 1920*1080 screen resolution.

Resolution	Size (GB)	Number of layers	Stereo	Cache size			
				1024 MB	2048 MB	3072 MB	4096 MB
5000*5000	14.4	13	✘	-	✓	✓	✓
10000*10000	15.3	2	✘	✓	✓	✓	✓
2000*2000	1	4	✘	✓	✓	✓	✓
2000*2000	6.51	21	✘	-	-	✓	✓
2400*2400	9.92	6	✓	-	✓	✓	✓
2048*2048	14.4	30	✓	-	-	✓	✓
5000*5000	28.8	26	✘	-	-	-	✓
5000*5000	57.7	26	✓	-	-	-	-

Network and Access Requirements for VR Lab in Multiscreen

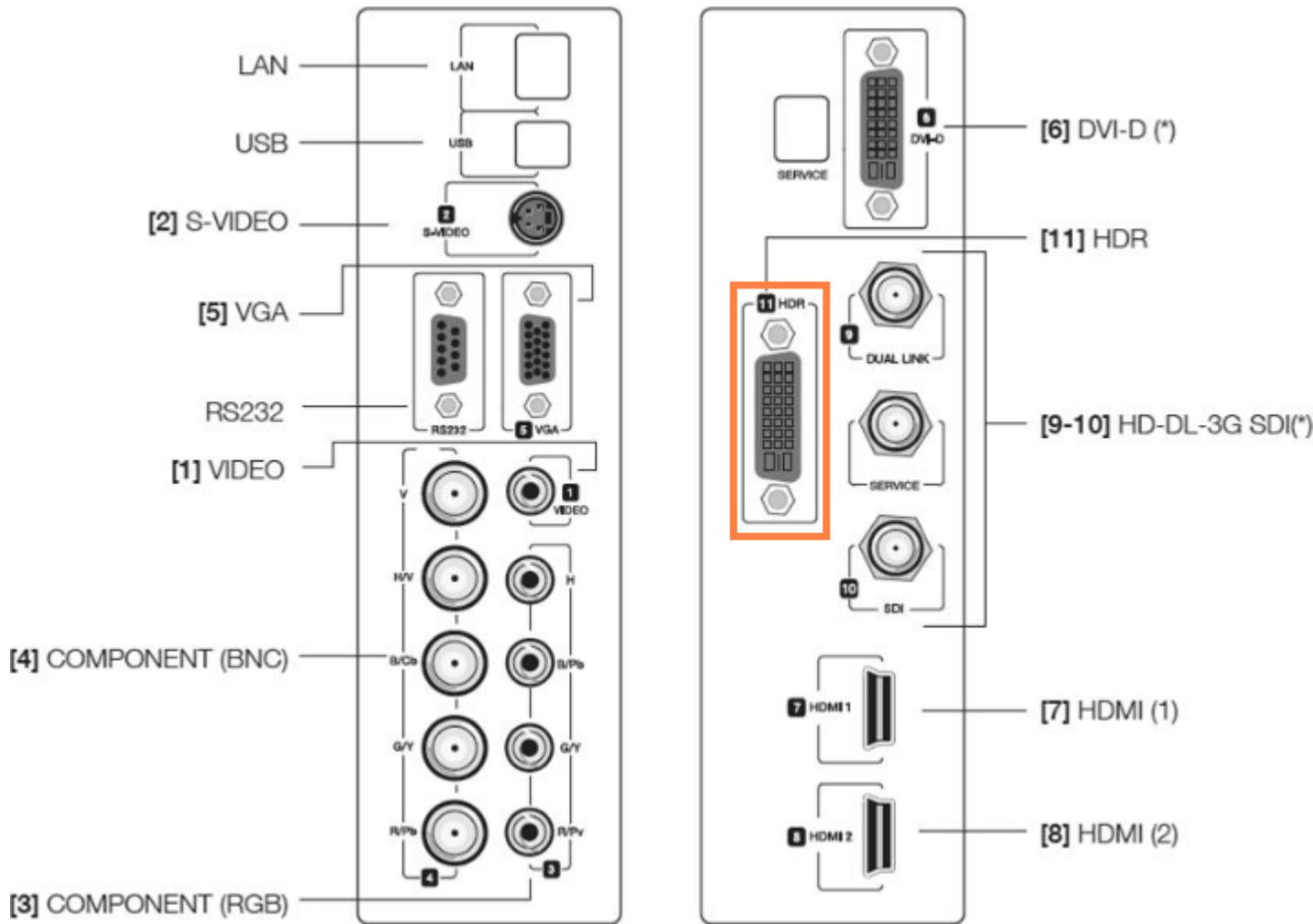
- Port 51008 must be available for the OPTIS Daemon in TCP.
- Port 51004 must be available for Virtual Reality Lab in TCP.
- Port 51005 must be available for Virtual Reality Lab in multicast UDP.
- Maximal Transmission Unit value must be set to default value (1500 bytes).

SIM2 HDR monitor for Virtual Reality Lab

- HDR47 Series monitor
- SIM2 HDR monitor has to be dedicated for rendering and a standard monitor for interface.
- High Dynamic Range DVI signal connector (#11).

Note:

Press F1 key on the remote control to activate the HDRI mode. See your SIM2 HDR display user manual for more information.



1.6. Third-Party Software and other Security Considerations

The following third-party products are used as part of the installation process. In order for the installation to work properly, you must allow access to these products.

Product Name	Executable Name
Tcl	tclsh.exe
Tk	want.exe
Perl	perl.exe
7zip	7z.exe
Microsoft .NET Framework	.net