schneider digital

Professional 3D-Hardware

3D PluraView

NVIDIA stereo settings on Linux systems

(X11/XORG Display Server only)

Rev 1.7

Introduction

NVIDIA provides a proprietary driver for Linux based systems, offering features including Quad-Buffered OpenGL Stereo on professional NVIDIA graphics cards.

However, this stereo feature and some multi-monitor options are only available on systems using the established X11/XORG Display Server, not its designated successor Wayland (see driver release notes [1]).

To check if Wayland is in use, run

```
$ echo $XDG_SESSION_TYPE
```

in a terminal window (if the output is Wayland, this is active).

You can try to change the Display Server to XORG, or set up a distribution which makes use of XORG by default. We have used the latest Kubuntu LTS, which uses KDE on XORG and otherwise relies on the stable basis and package management of Ubuntu.

Installation

Step 1:

Connect only the **Bottom** display cable for now. No **Top**, no additional monitor.

Step 2:

While not explicitly necessary, updating the whole system might avoid problems with the driver requirements (see release notes again). Open a terminal window, and is in use, run

```
$ sudo apt update
$ sudo apt upgrade
```

and confirm the latter with [y]es.

(K)Ubuntu, amongst other distributions, uses the `apt` package manager and `sudo` for root access. You have to use other commands or packet managers, depending on your Linux flavor, e.g. the basic `su` command, or you can install `sudo` on most other systems, e.g.

```
$ apt-get install sudo   # Debian
$ yum install sudo       # CentOS
```

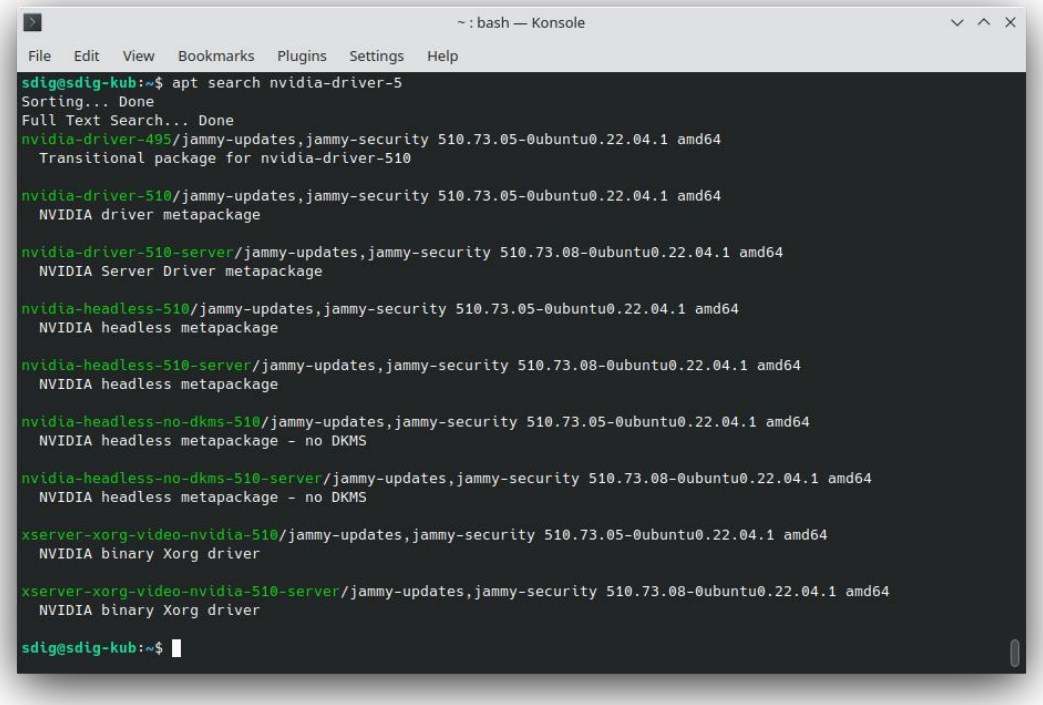
This is information taken from various FAQs, Schneider Digital can't provide support for every Linux distribution and version available.

Step 3:

If you don't know already which driver version you want to use, run

```
$ apt search nvidia-driver          # all avail., or
$ apt search nvidia-driver-5        # only branch 5xx
```

for a list of available versions.



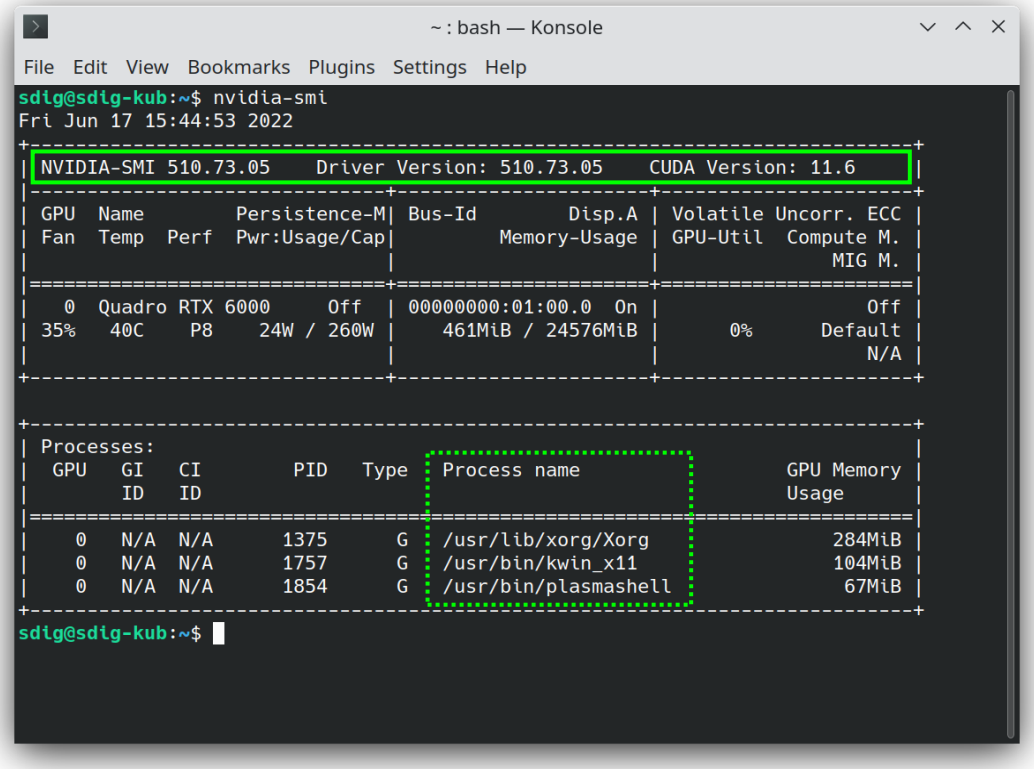
The driver is installed the by the following command (use only the basic nvidia-driver-XXX package) and reboot afterwards:

```
$ sudo apt install nvidia-driver-510
  # confirm with [y]es
$ sudo reboot
```

If your packet manger doesn't offer an up-to-date driver package (or none at all), you can try to download the driver appropriate for your system architecture on https://www.nvidia.com/object/unix.html and perform a manual installation; the exact procedure varies depending on your system, but some guidance is given in the driver's readme files.

Step 4:

After rebooting, open the terminal again and verify that the proprietary driver is actually in use – the driver version you have installed should be in the header line, and the term "nouveau" doesn't show up in process names. (nouveau is the open source driver which we can't use for stereo).

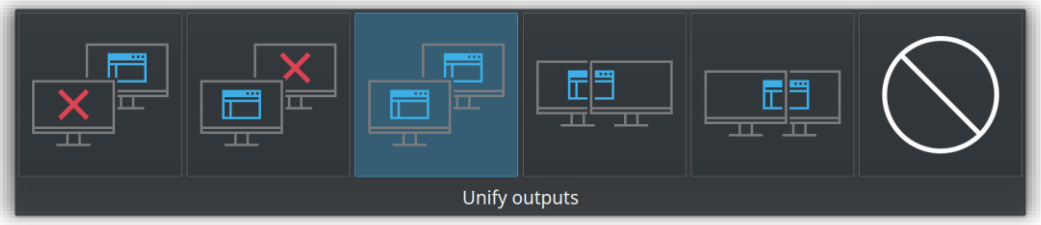



```
$ nvidia-smi
```

Step 5:

Now connect the **Top** monitor cable.

On KDE and some other modern desktops, a pop-up (similar to the Windows projection options) appears, chose “Unify outputs” here to clone the screens; if needed, you can reopen the pop-up by pressing ⊞+P on your keyboard (⌘ / 🐧 / **SUPER** key on other keyboards without a Windows key).



If your desktop environment doesn’t offer this method, right-click on the desktop and chose the menu option named “Display settings” or similar.

In the following options, “clone” one display from the other, or “duplicate” view -naming varies with every desktop manager.

The result should be two identical (mirrored) pictures and a synchronously moving cursor on the two monitors.

Step 6:

Head back to the terminal, and run

```
$ sudo nvidia-xconfig --stereo=4 --no-composite
```

This will create a new or alter the existing xorg.conf file with the necessary video options [2]. (Ignore potential errors about a missing package 'xorg-server').

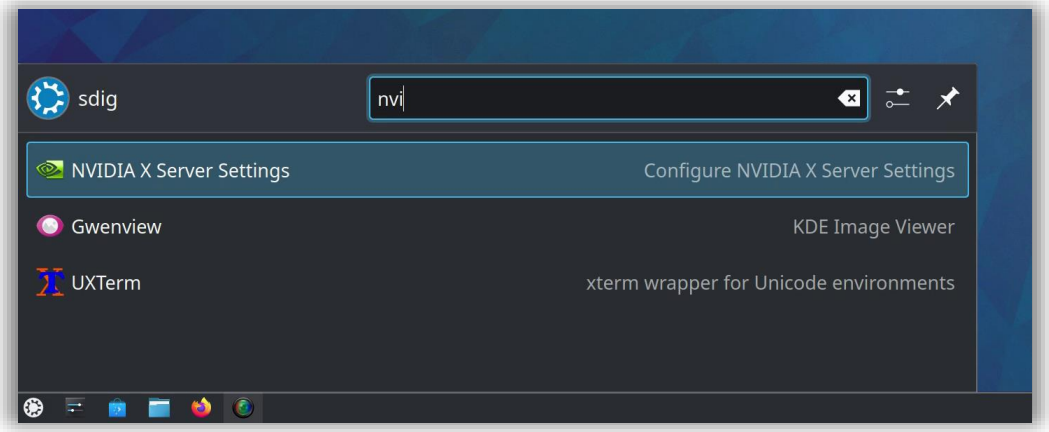
Stereo mode 4 is Quad-Buffered OpenGL, for other modes and options see the xconfig readme file [1].

Reboot.

```
$ sudo reboot
```

Step 7:

Start the NVIDIA driver (X Server) settings from the application launcher or start menu.



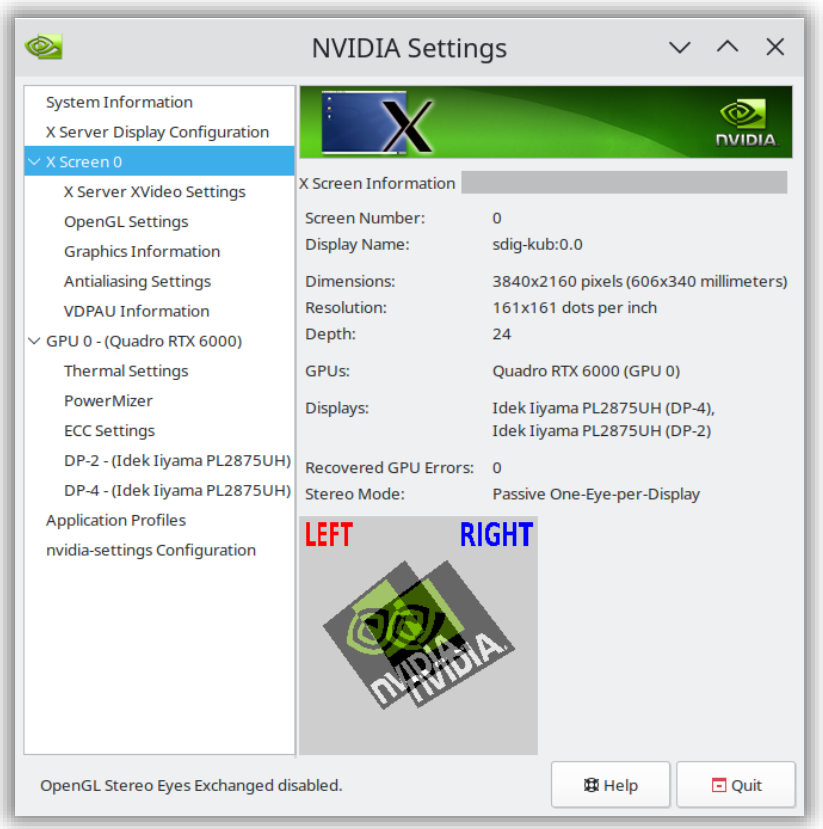
Alternatively, you can launch the settings from a terminal with

```
$ nvidia-settings
```

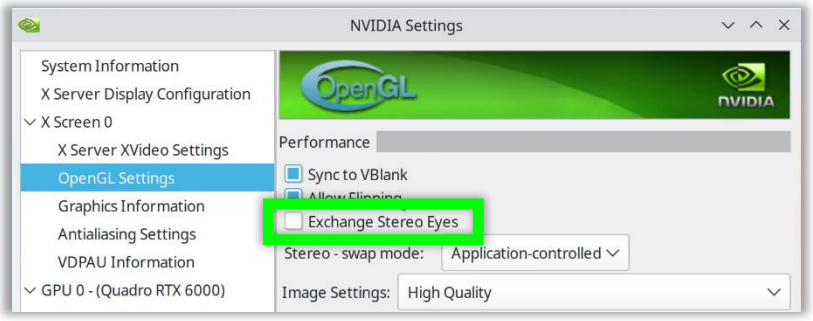
If changes regarding display setup, screen resolution or color depth have to be made, prepend `sudo` to the command to start the settings as root.
Simple operations like swapping stereo eyes don't need root permission.

The settings made by `nvidia-xconfig` in step 6 should result in the following setup. If this is not the case, try step 6 again (make sure `nvidia-xconfig` has root permissions), otherwise try to set up the displays manually as described in step 8.

Go to section X screen 0 – when all went right, you already see a spinning cube in 3D. Check with the 3D PluraView glasses if LEFT & RIGHT views are for the appropriate eye.



In case you need to swap – chose “Exchange Stereo Eyes” in “OpenGL Settings”. The change is being applied immediately and can be seen in the cube animation from above.



Step 8:

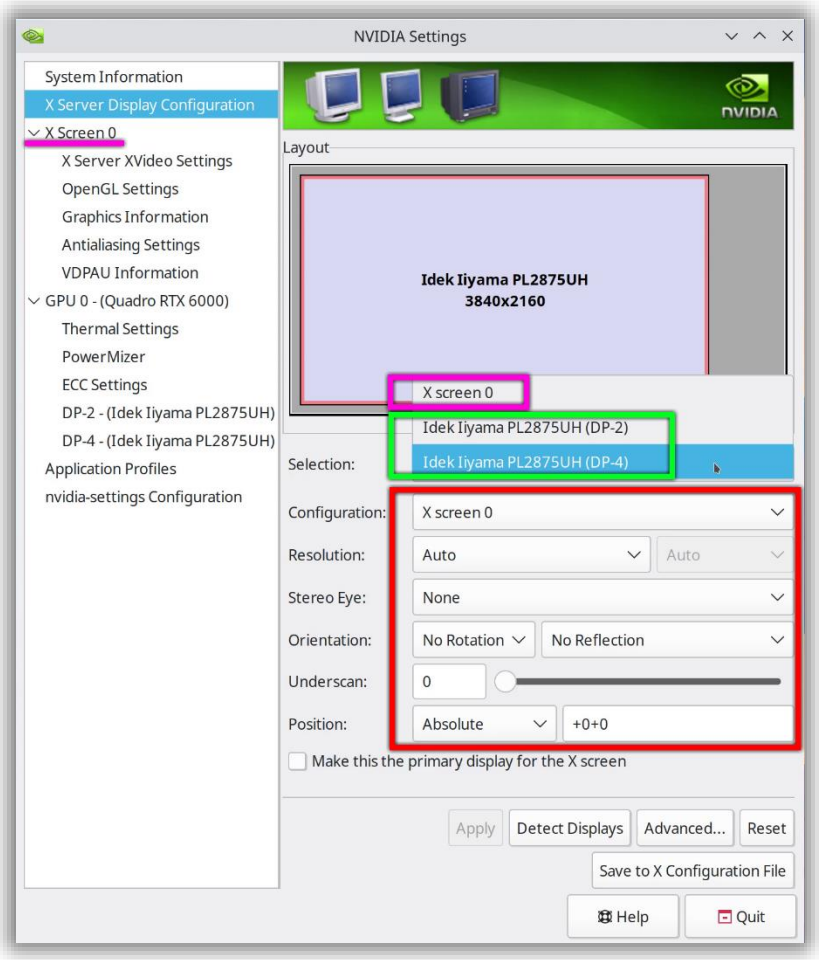
Only needed when the automatic configuration failed!

Open `nvidia-settings` as root:

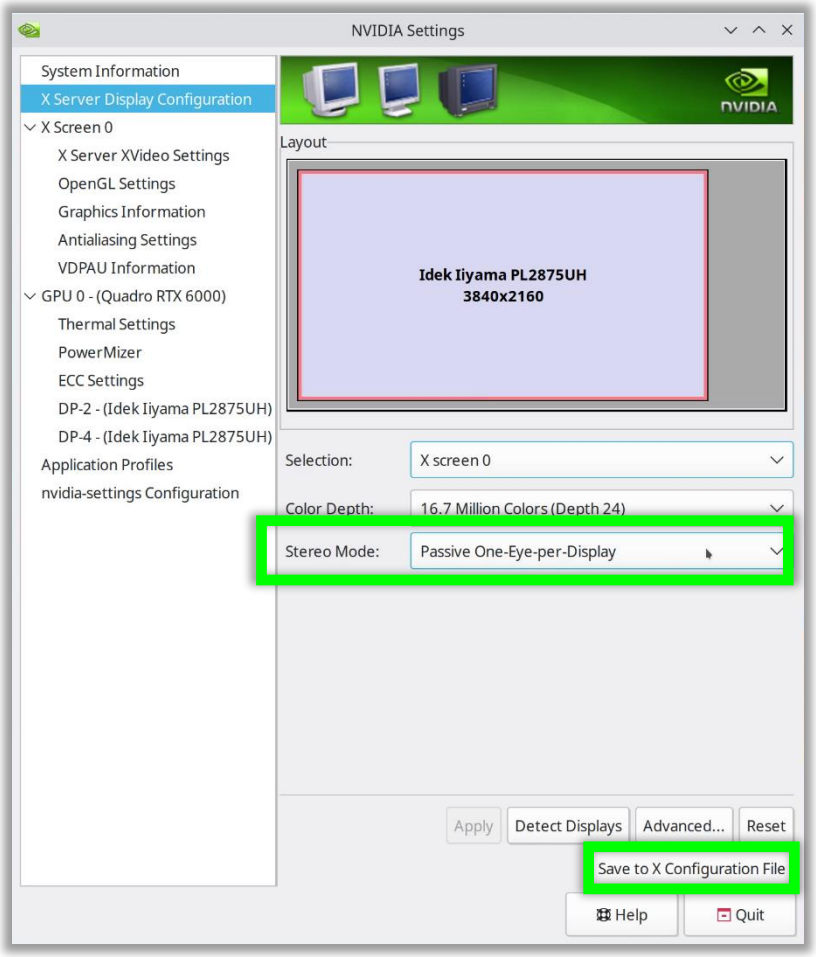
```
$ sudo nvidia-settings
```

In section “X Server Display Configuration”, in the “Selection” drop-down menu, you should see two identical displays 🟢 (depending on your 3D PluraView model), as well as one virtual “X Screen 0” 🟣 (also visible on the left as a section).

If you have already configured multiple X Screens, please ask your administrator for advice.
Otherwise, select each of the two displays and adjust the options for both as shown here 🔴:



Then chose “X Screen 0” from the drop-down menu, and set “Stereo Mode” to “Passive One-Eye-per-Display”.



Finally, chose “Save to X Configuration file” (works only when the settings have been started as root), and reboot the system.
After that, check step 7 again.

Step 9 (optional):

For demonstrational purpose or an additional proof of function, you can install PyMOL (a molecular visualization application capable of Quad-Buffered OpenGL stereo).

If PyMOL is available from your distribution's package manager, it's as easy as

```
$ sudo apt install pymol
```

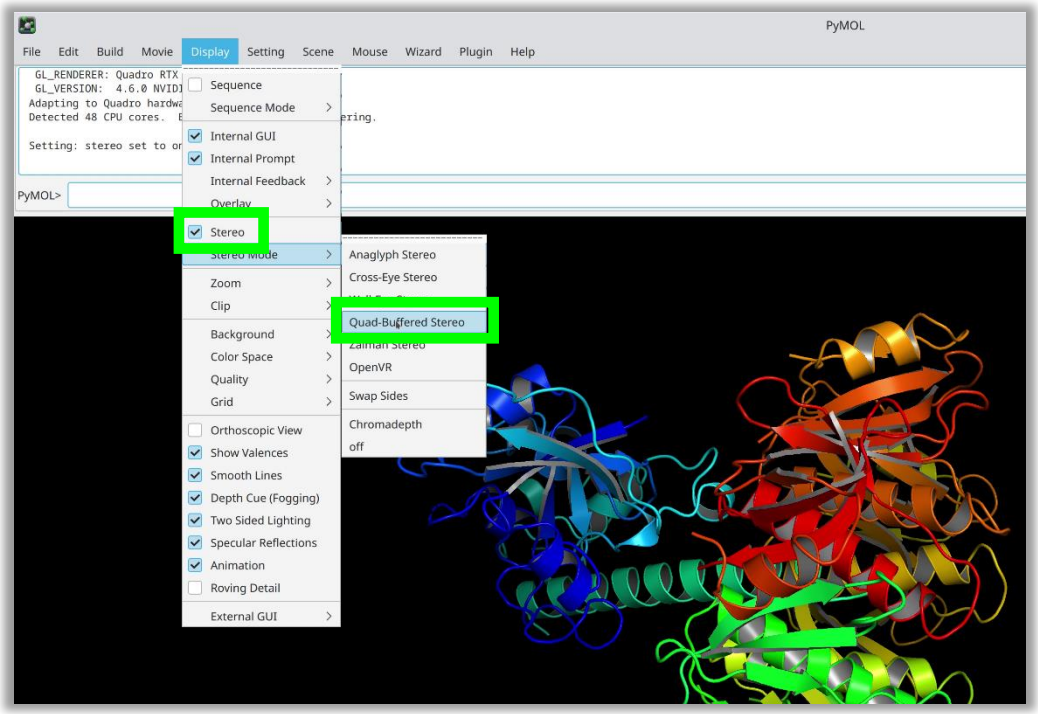
Otherwise, you can download the package from pymol.org.

Run the software with parameter `-S` (otherwise, Quad-Buffered stereo might not be recognized.)

```
$ pymol -S
```

Load a demo scene, for example "Wizard" > "Demo" > "Cartoon Ribbons".

From the "Display" menu activate "Stereo" in general, then switch to "Quad-Buffered Stereo" in the submenu – done.



[1] The NVIDIA release notes for the latest driver (at the present time of writing) can be found here:
https://download.nvidia.com/XFree86/Linux-x86_64/515.48.07/README/

For the latest docs, you can substitute the version number above by the one found in https://download.nvidia.com/XFree86/Linux-x86_64/latest.txt,
or get them from the driver list at https://www.nvidia.com/en-us/drivers/unix/
(version numbers are linked to download pages, and the readme can be found in tab "additional information").

[2] Using the `--no-composite` switch for nvidia-xconfig in step 6 disables desktop composition, this results in short distortions when moving windows around on the desktop. It seems was necessary in our setup in order to activate 3D stereo at all (we'll look further into that), and it has no impact on the applications themselves, so it's most likely a bearable compromise for now.

Appendix:

Useful resources on the Schneider Digital website:

Workstations (driver)

- PULSARON (AMD)
- CENTURON (INTEL)

Professional Graphics Card

- 01 QUADRO / RTX-Enterprise driver
- 02 TESLA driver
- 03 GRID driver
- 04 LINUX driver
- 05 STUDIO driver
- 06 NVS driver
- BIOS

- Quadro-Sync
- Mosaic Tool
- Enterprise Management Toolkit
- Older Operating-Systems XP Server2003
- Older Quadro-Cards
- Uninstaller

Workstation (Tools / Benchmarks / Diagnostik)

- CPU-BurnIn
- Benchmarks
- CPU-Diagnostic
- Memory RAM
- HW Temperature Tools
- HW Reporting

Remote Support: TeamViewer download

This executable file will open a maintenance session without installation.
(Available for Windows, Mac, Linux, ChromeOS and some more.)

Feel free to contact us at support@schneider-digital.com for any questions, or call us: +49 (8025) 9930-10.

SCHNEIDER DIGITAL
Josef J. Schneider e.K.

Maxlrainer Straße 10
D-83714 Miesbach

Tel.: +49 (8025) 9930-0
Fax: +49 (8025) 9930-29

www.schneider-digital.com
info@schneider-digital.com

Partner of: