Changelog (07/23/2020)

- added PolarisBoost extension
- added section about Mac Fan Control
- changed title to: Using the Catalina Loader on an iMac
- added D670000 device-id to 2011 section to see AMD temps
- error correction
- dropping sleep kext installation and linked this to online post, section 10 shows how to achieve the installation using terminal commands, only.
- minor clarifications
- deleting sections 11-13 and the RadeonBoost part

This document reflects the current state as of July 2020. While High Sierra is supported by Apple on these machines and needs no adjustment we have currently no dosdude1.com support to add needed patches especially on the 2011 models in one single installation step. If you experience a black screen after boot please follow the instructions and install this extension. Pressing the alt/option on boot should prevent the black screen issue in any case.

For this reason we have to do some manual adjustments documented here. dosdude1 announced lately to include these adjustments in upcoming patcher versions. Let's wait and see.

Bevor starting the installation on the iMac mid 2011 models get also the latest files from @highvoltage12v post, especially the AppleGVA.framework and the AppleIntelSNB* files - there are patched versions for AMD card users out, now. And there are two different sets for Mojave and Catalina! This Guide is focussing on Catalina.

Additionally you should upgrade the Extensions Lilu und WhateverGreen stored on the OpenCore image and in the archive you downloaded from the post two lines up.

These more up to date files have to replace the versions delivered on the OpenCore image.

Installing and using the OpenCore Catalina Loader on an iMac 2009/2010/2011

Currently supported for the following cards listed online. Other cards may be added when new vBIOS versions become available.

We will be using OpenCore boot loader to give several MXM graphics cards brightness control and boot screen functionality.

The complete feature list can be found on the boot image you are going to download in the file "iMac README.TXT" in the Docs Folder. **Please read this document** after download and writing the image in step 8.

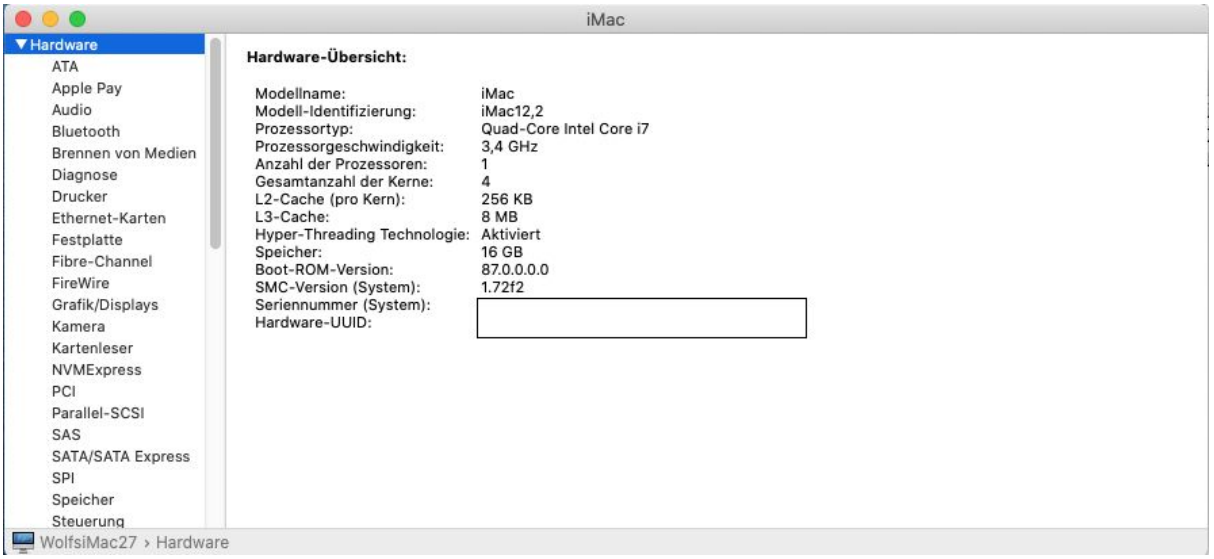
Additionally we can inject kernel extensions on boot instead installing the extensions directly on the boot disk. This makes changes easy since we manipulate everything from within OpenCore.

1. **Update the firmware of your iMac to the latest release**.

The most easy way is to do the Internet Recovery installing High Sierra from Apple and load all subsequent updates available, the latest security update came out in May, 2020. Reboot after the last update and wait for the long lasting firmware upgrade included to be successfully applied to your machine. Check your success confirming the version you have currently installed from the About the Mac->System Report->Hardware panel and this list.

Most recent firmware release numbers have the form xx.0.0.0.0 - if you see something really different repeat the installation and upgrade until you have the firmware upgrade installed. Without this there will be - probably - no way to use the OpenCore boot loader or Mojave or Catalina at all.

Even if you just have replaced a graphics card with an older MacOS version running you need the latest firmware release to get OpenCore working. There is no way around this!



2. **MacOS Installation**

Download the latest copy of Catalina or Mojave using the latest www.dosdude1.com patcher on your iMac or stick with your up to date High Sierra installation.

To fence out upcoming problems after installing a new graphics adapter we recommend to test this new piece of hardware with the latest known by Apple supported OS (which is High Sierra), run benchmarks, check sleep mode and reboot. Then move on to more recent MacOS versions like Mojave or Catalina.

The latest Apple upgrade as of May 2020 brought us a new obstacle to overcome, after reboot some people have a black screen. For this reason Catalina 10.15.4 and newer need also the installation of another extension. It is done exactly the same way as described in steps 10-13 of this document and you will find the extension file here an a further note unter point 18. below. High Sierra including the latest update as of May, 2020 may face the same issue.
With Catalina 10.15.6 Apple seem to correct this black screen issue, again!

If you plan to install Mojave or Catalina please use the latest version and install all available security upgrades before applying the patches mentioned later. Some of these files are based of more recent versions of Mojave or Catalina and will simply not work with the initial releases of Mojave and Catalina.

The use of OpenCore with the iMacPro1,1 board-id may hide most of these issues.

3. **SD Card**

Prepare the following tasks and get SD card or a USB memory stick of at least the 2GB size. I will refer to an SD card on the following lines.

4. **OpenCore**

Download the OpenCore disk image from @Nick [D]vB post.

5. **Get some Tools - BalenaEtcher**

Download the Balena Etcher tool to write the image contents to the SD card and save it locally in your programs folder.

6. **Get some Tools - Kext Utility**

Download the Kext Utility and save it locally in your programs folder or put it later on the SD card holding the Catalina Loader.

7. **Copy OpenCore Image to SD card**

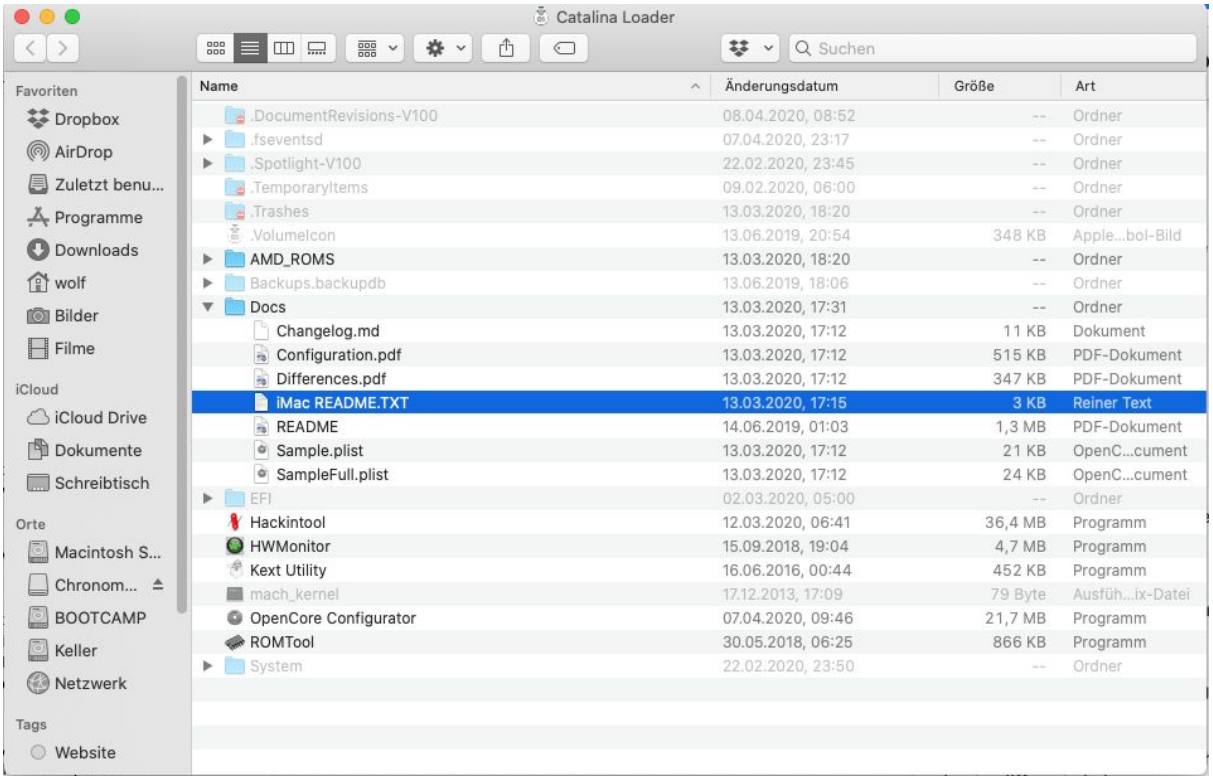
Start Balena Etcher program and copy the OpenCore Image to the SD card. An error message comes up, ignore it.

8. **Activate OpenCore SD card**

Plug the SD card and reinsert it - the Catalina Loader image will be activated. If you have configured the Finder to show internal disks on the Desktop it will be shown there, otherwise open a Finder window and search it.

You may copy the Kext Utility to the SD card. The later to be used programs and tools are still there.

Open the Catalina Loader. Now you may also read the documents provided by Nick:



9. **Make hidden files visible**

Just use the key shortcut and press **Cmd+Shift+.** (Command Shift .) or for a more permanent solution open the Terminal App and and enter the command line followed by pressing the enter key:

defaults write com.apple.finder AppleShowAllFiles TRUE; killall Finder

10. Installing Extensions to get sleep back and avoid kernel panics (iMac 2011, only)

As of Mac OS 10.14/10.15 it is necessary to re-add back the missing Sandy Bridge AppleIntelHD3000 kexts for proper sleep functionality, iGPU H.264 video encoding, and Airplay Mirroring. Proper functionality will only work if all HD3000 plugin/bundle files are either installed on disk in /S*/L*/E*.

To prevent your iMac from Kernel Panicking a patched copy of IOSurface.kext and AppleMCCSControl.kext must be installed to /System/Library/Extensions. **After every software update it is necessary to boot your iMac without Open Core and reinstall IOSurface.kext & AppleMCCSControl and the AppleGVA.framework as described above..**

Bevor starting the installation on the iMac mid 2011 models get the latest files from @highvoltage12v post, especially the AppleGVA.framework and the AppleIntelSNB* files - there are patched versions for AMD card users out, now. And there are two different sets for Mojave and Catalina! This Guide is focussing on Catalina.

Additionally you should upgrade the Extensions Lilu und WhateverGreen on the OpenCore image unless we release a new version of the OpenCore image.

There are two ways to accomplish this goal, one is relying on terminal commands, the other one on applications giving an inexperienced user a better feeling doing this task. If you never used the terminal go ahead to 11.

You have to disable SIP. Using @dosdude1 installed Mojave or Catalina this has been already done.

Terminal:

First: Remount the system partition in read/write mode (default is read, only) - you will be asked for your password:

```
sudo spctl --master-disable
sudo mount -uw /
sudo killall Finder
```

Second: Open the target folders in Finder:

```
open /System/Library/Extensions
open /System/Library/PrivateFrameworks
```

Third: Copy Extensions and single framework using Finder drag and drop, and answer with replace in any case! You may use the sudo ditto command to copy the extensions (which are in reallty folder, not simple files)

Fourth: Relink the prelinked Kernel:

```
sudo chown -R 0:0 /System/Library/Extension/
sudo chmod -R 755 /System/Library/Extension/
sudo kextcache -i /
```

sudo kcditto (Catalina, only)

Fifth: copy the AppleGVA.framework to the /System/Library/PrivateFrameworks Folder replacing the existing one using sudo ditto or Finder drag and drop and enter these commands

sudo chown -R 0:0 /System/Library/PrivateFrameworks/AppleGVA.framework/
sudo chmod -R 755 /System/Library/PrivateFrameworks/AppleGVA.framework/

Last: Restart the machine

sudo reboot

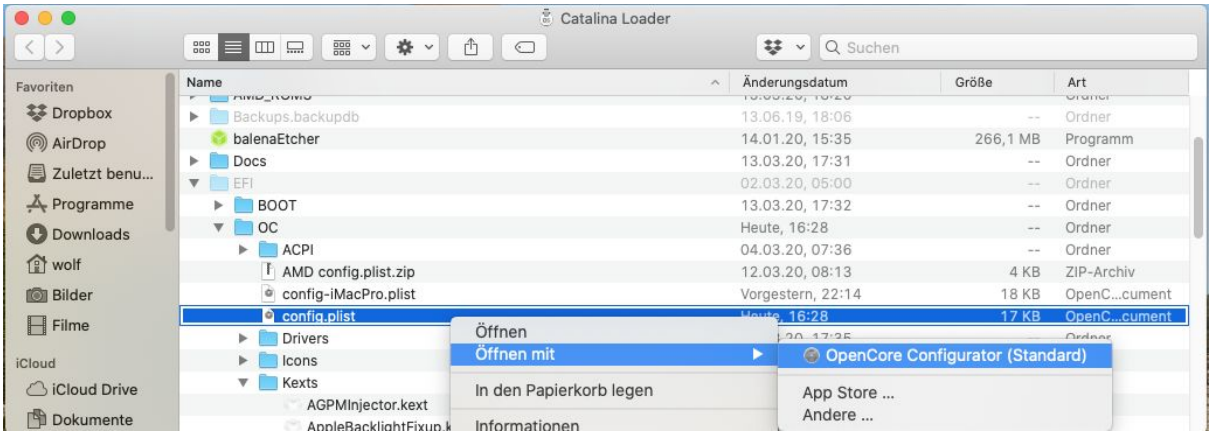
11. Configure OpenCore

NOTE:
The main difference between Nvidia and AMD installations will be the usage if the iMacPro1,1 ID with the AMD systems using OpenCore. This let's your iMac look like a brand new 2019 machine and avoids a lot of software issues lately occurred with Catalina updates, namely the black screen issue. This is achieved by selecting the correct AMD config.plist from the Catalina Loader. Per default the Nvidia version has been unzipped and installed on it.

Now we have to configure the OpenCore config.plist using the OpenCore Configurator installed on the Catalina Loader SD card.

If you have installed an Nvidia card continue straight to open the OpenCore Configurator, otherwise delete the existing file config.plist and decompress the prepared AMD version named "AMD config.plist.zip". After decompressing rename this file to "config.plist".

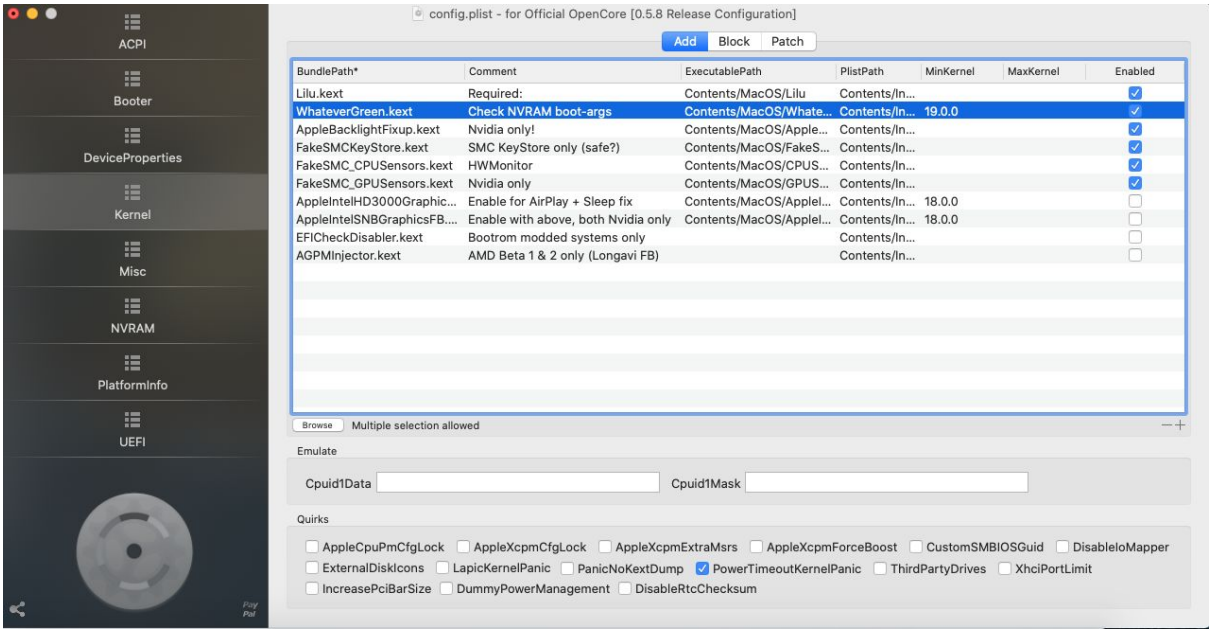
Now open the file config.plist by (right) clicking the config.plist on the Catalina Loader SD Card:



Nvidia Users:

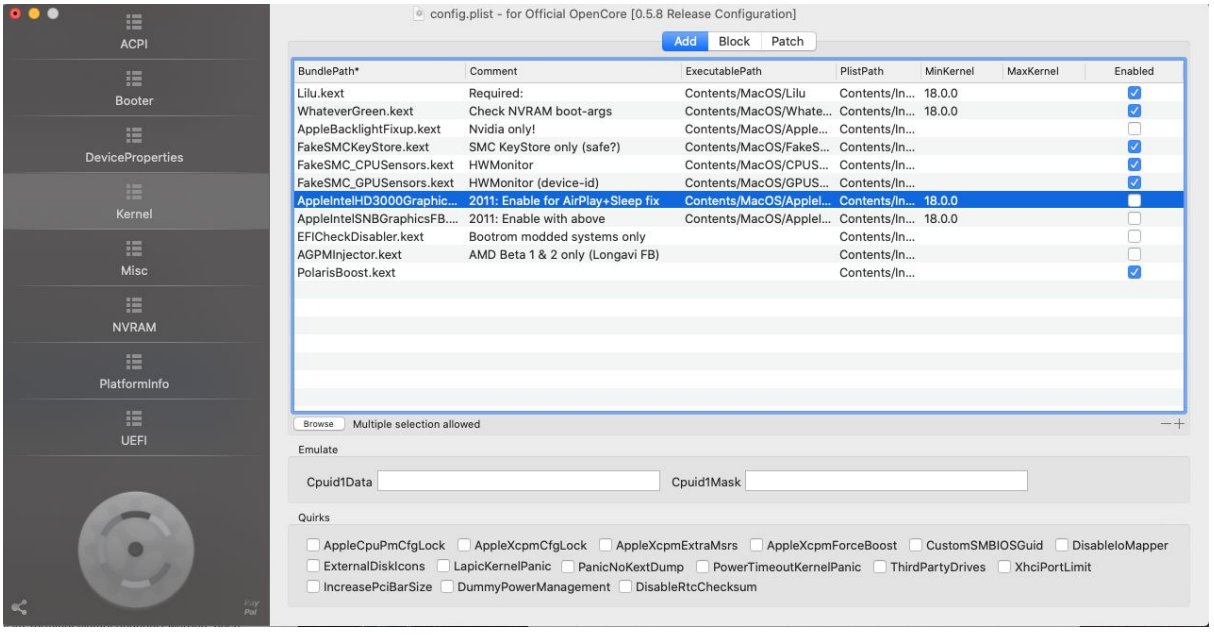
The OpenCore Configuration will open a Window having eight categories. Most sections don't need to be changed.

Choose the **Kernel** section, if you have an Nvidia Card running Catalina enable the first 6 kernel extensions, save the config to disk and leave the program (this will work for late 2009, 2010 and mid 2011 models).



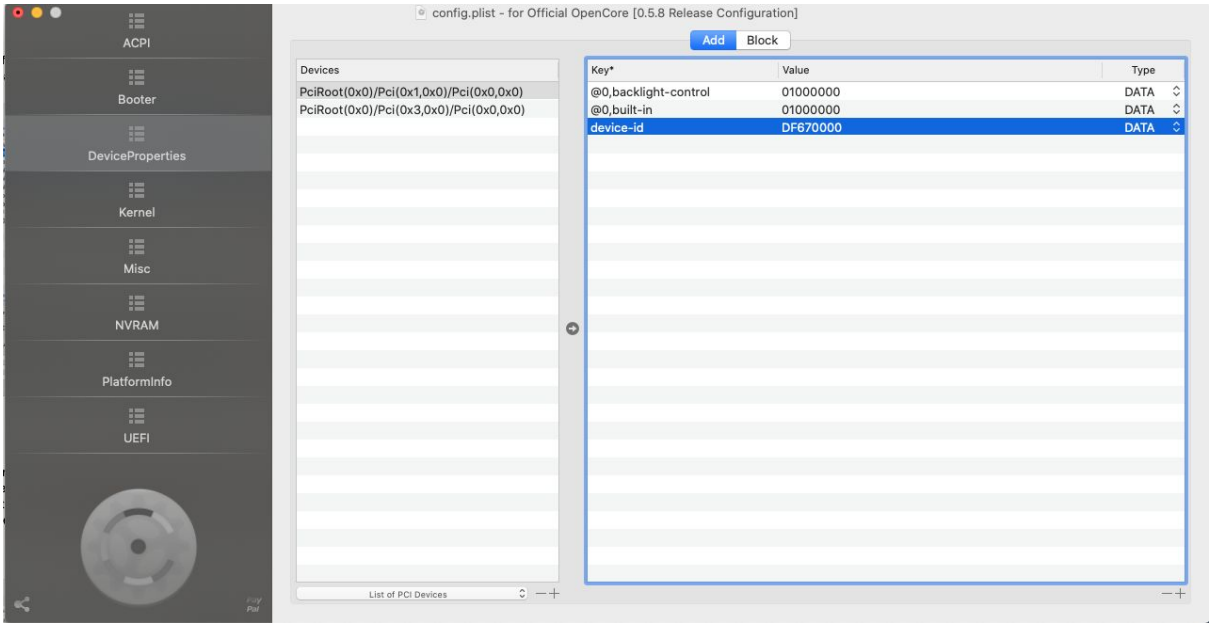
AMD Users:

Choose the **Kernel** section and 2011 users check as shown in the picture. Users of 2009 and 2010 models please uncheck in any case the AppleIntelHD3000 and AppleIntelSNBGraphics kext sets.



In contradiction to the comment the FakeSMC_GPUSensors.kext is working with AMD cards, too. You have to select the injection of the extension and additionally set the device ID **DF67000** in the DeviceProperties Section.

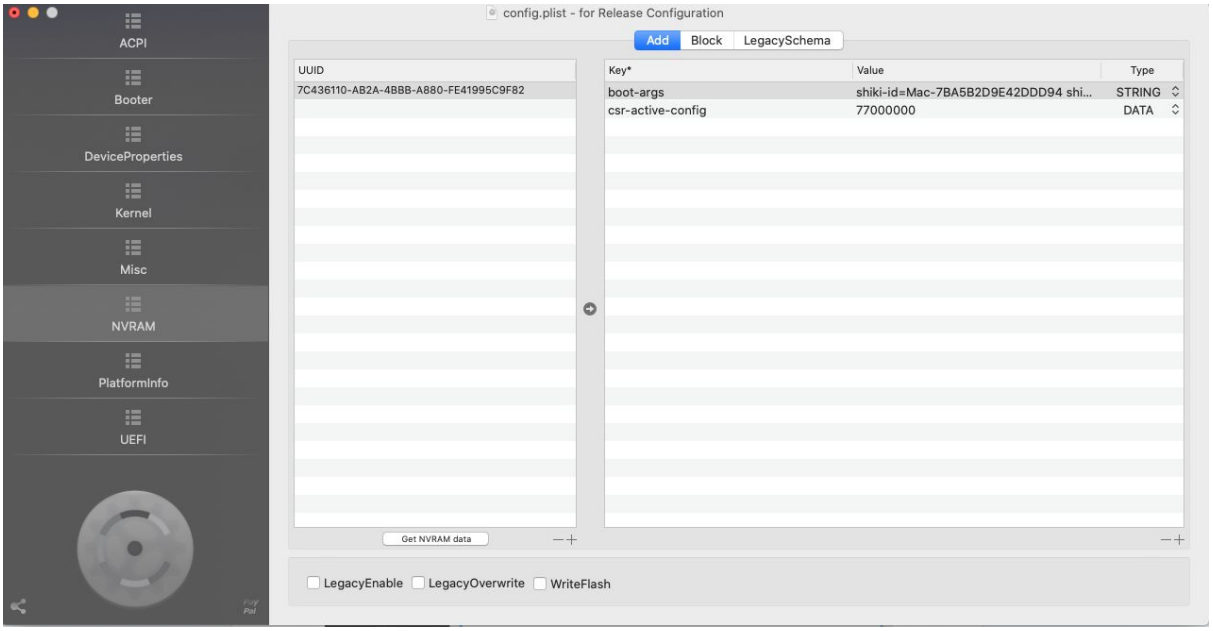
Now you will see the “graphics card” temperature data in same way the script “GPU monitor” will show, but it is not the particular “GPU die” temperature which the Apple SMC is using to control the fans - **we still need a third party solution like Mac Fan Control and other to keep track of the temperature of the sink and the card**. Otherwise you will likely burn your GPU to death in short time.



Now adjust **boot-args** in the **NVRAM** section **(AMD users, only!!)**

boot-args

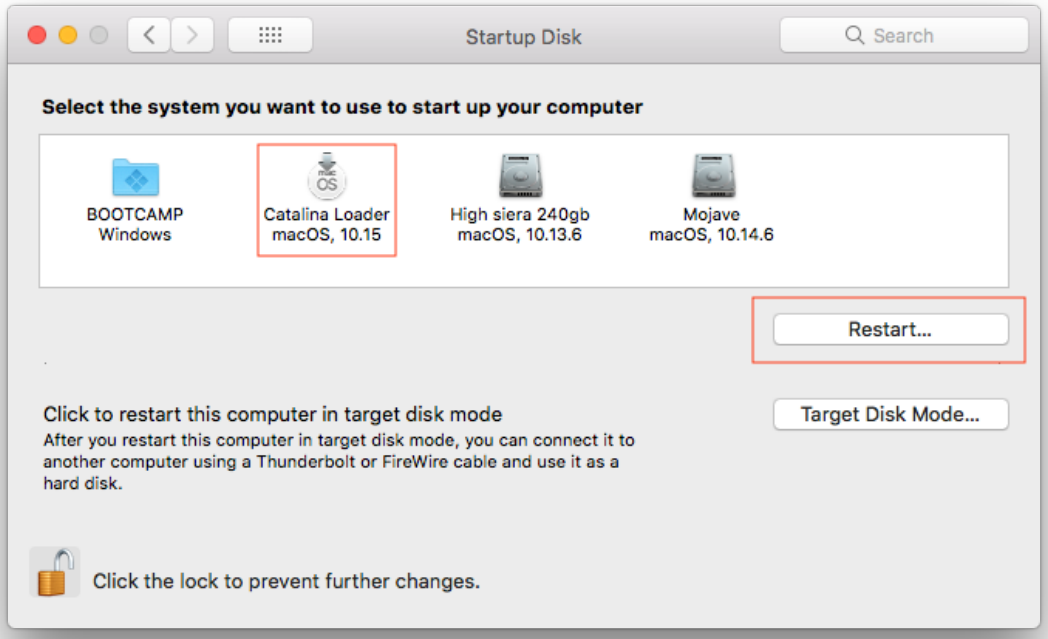
shiki-id=Mac-7BA5B2D9E42DDD94 shikigva=80 agdpmod=pikera -no_compat_check



Save the config!

12. Booting of the SD card or Catalina Loader

Open System Preferences and unlock the profile pane, select Catalina Loader macOS 10.15, then click restart and your iMac should boot to Open Core.

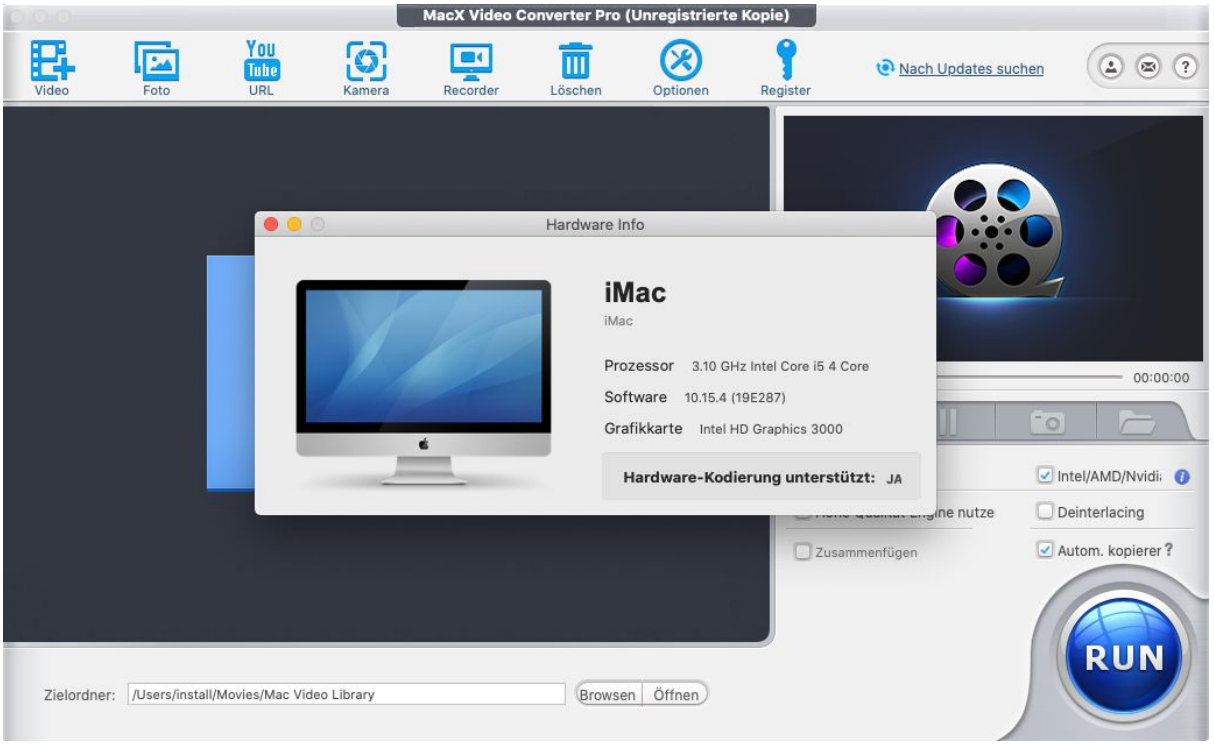


Now select “Restart…”. Brightness control, sleep, wake up, Airplay/Intel H.264 should now be fully functional.

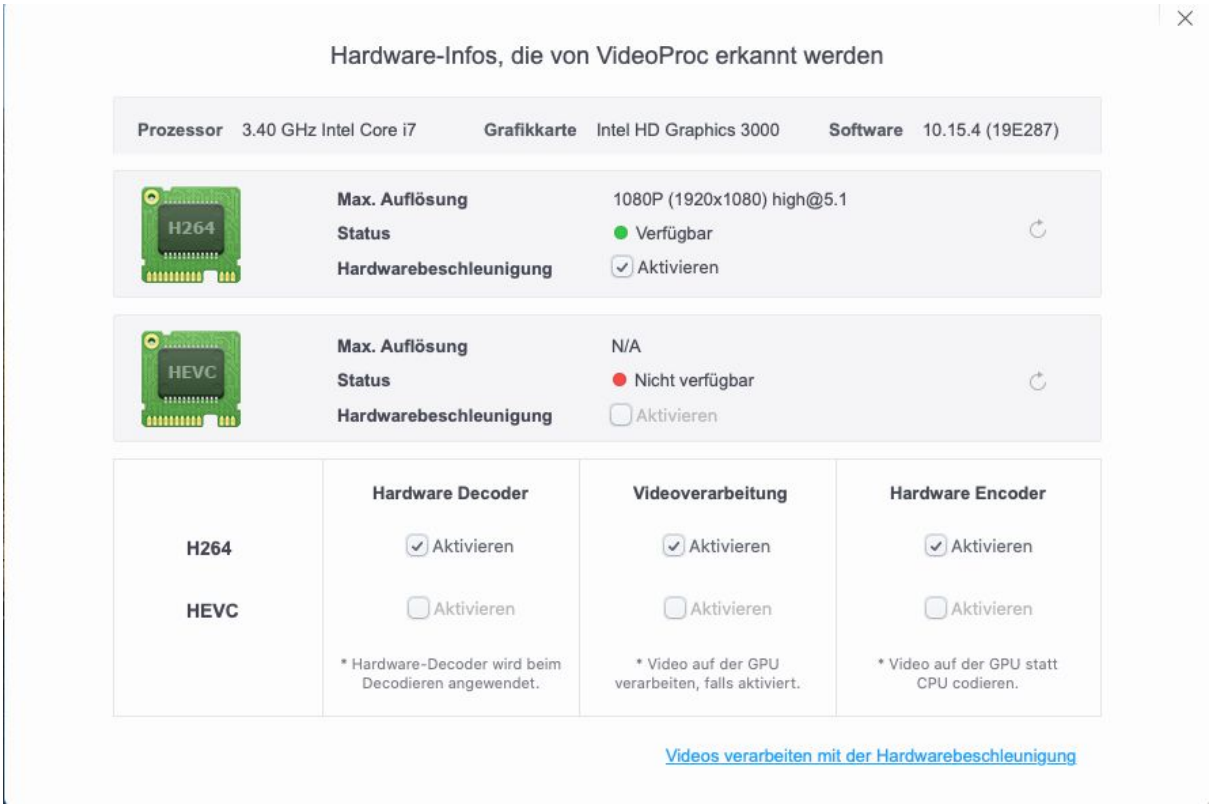
13. Checking your success (Video acceleration)

To check the H.264 and other features you might download a test version of VideoProc or MaxC Video Converter Pro.

The VideoConverter started on an iMac 2011 with an Nvidia card will get a message like this (Hardware Converter Support: yes).



Nvidia users running VideoProc will get a feedback like this:



AMD users using the VideoProc should get this. You can force the program to search for graphics hardware by clicking the circle arrow icon on the right. It will take some time and then in comes usually back with this screen:

14. Catalina 10.15.4 issue: Screen stays black after final installation for Nvidia card users

Just do it to install the single kext file posted by @highvoltag12v in the forum. It will re enable the internal LCD. AMD users using the MacPro1,1 ID will probably not face this issue.

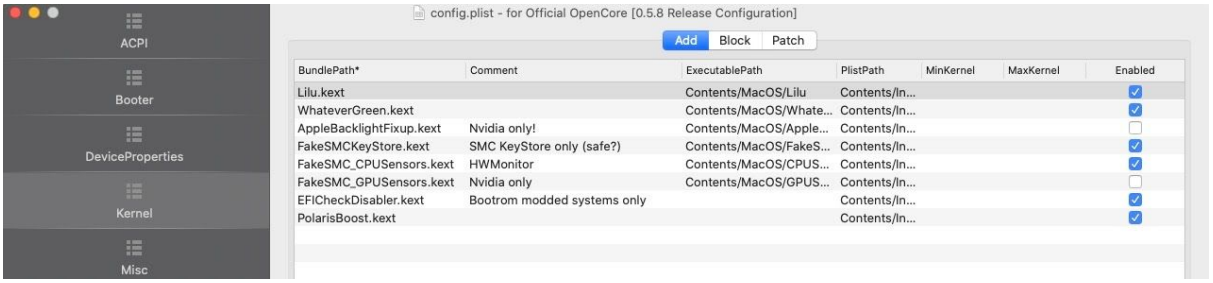
15. Tuning OpenGL performance with AMD cards (WX4130, WX4150, WX4170, WX7100)

First update to the latest versions of Lilu and WhatEverGreen on you OpenCore installation.

For yet unknown reasons the WX4170 and WX7100 showed up initially with a sleeping disease, i.e. after the first sleep cycle the performance of these AMD cards dropped down. Based on the RadeonBoost kext Pascal boiled down a basic kernel extension which can be used with all currently known cards to come around this performance degradation, the derivative is named PolarisBoost for obvious reason.

To achieve all this simply use the PolarisBoost extension added to the post where you found this doc, too.

Copy PolarisBoost.kext in OC/Kexts/.
Inject PolarisBoost.kext in OpenCore Kernel section.

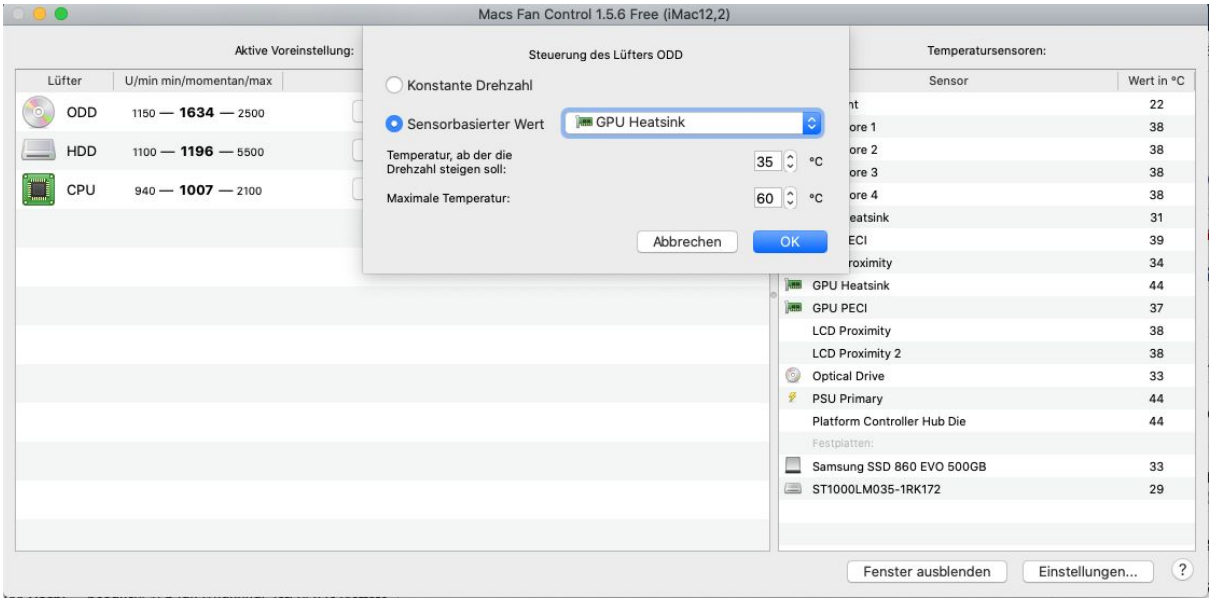


16. Heat Management

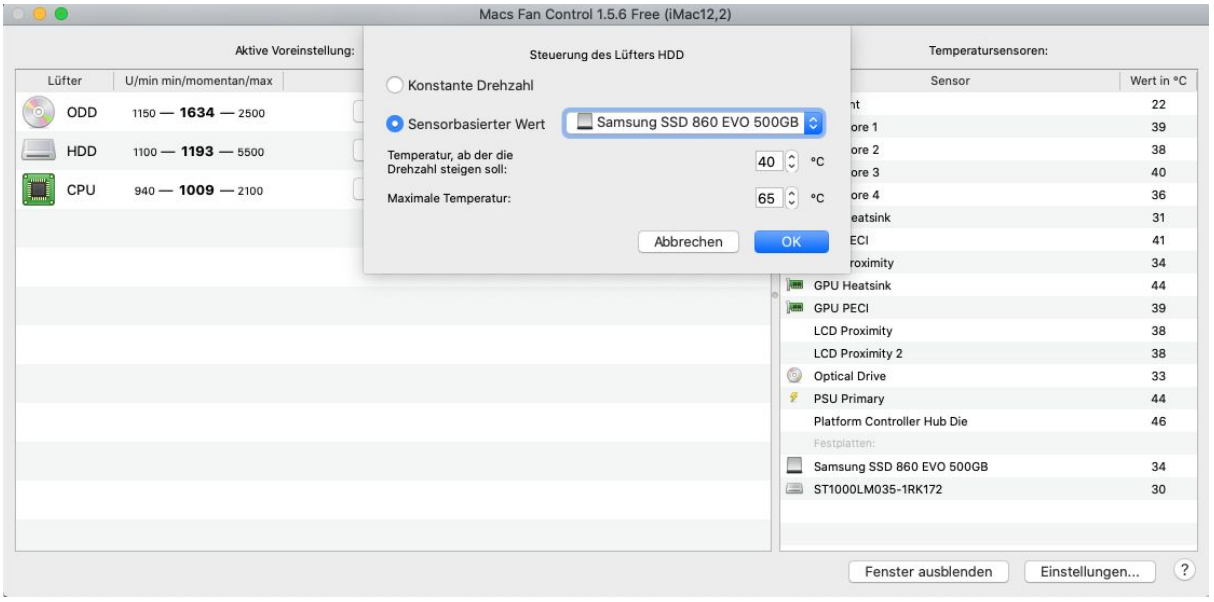
The final step before going into the long term use of your new graphics card is the management of the temperature inside your iMac. Because we still have no access to the original GPU die temperature we need to use Mac Fan Control (or a similar tool) and the GPU Peci or the GPU Heatsink temperature to control the ODD fan.

Since the GPU Peci may vary on a shorter timescale my recommendation is to use the heat sink temperature. Finally it is the heat sink which will be cooled directly by the fan, not the GPU itself. The same applies to the CPU heat sink. Assuming that you have additionally changed the old HDD with a new SSD and lost the temperature control there too you can use the following recommendations:

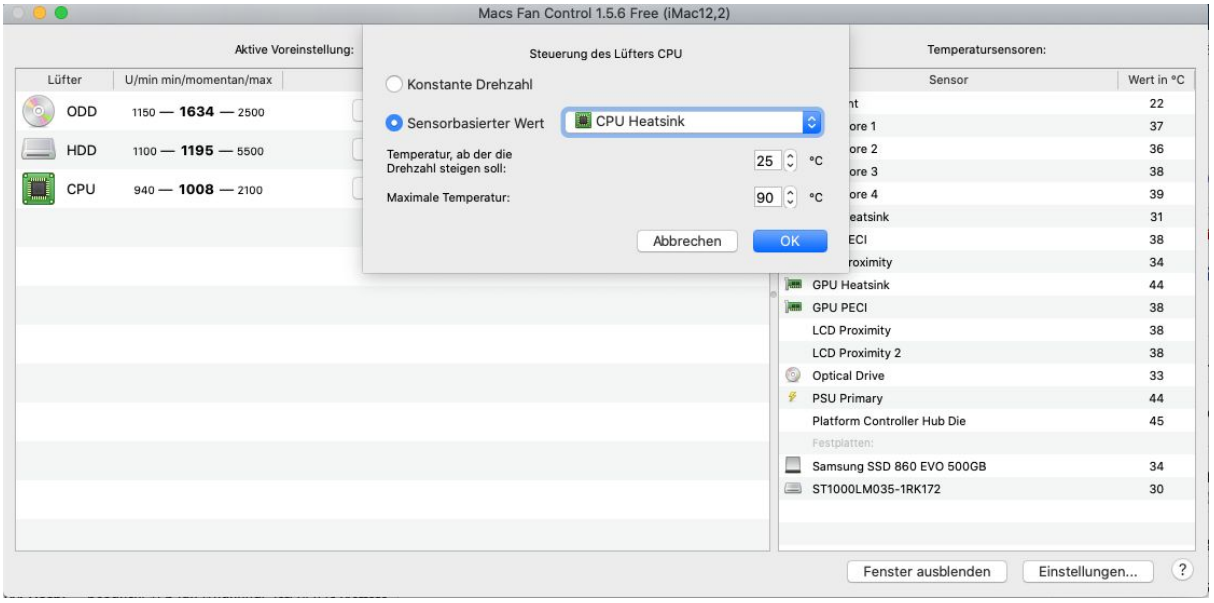
GPU and ODD:



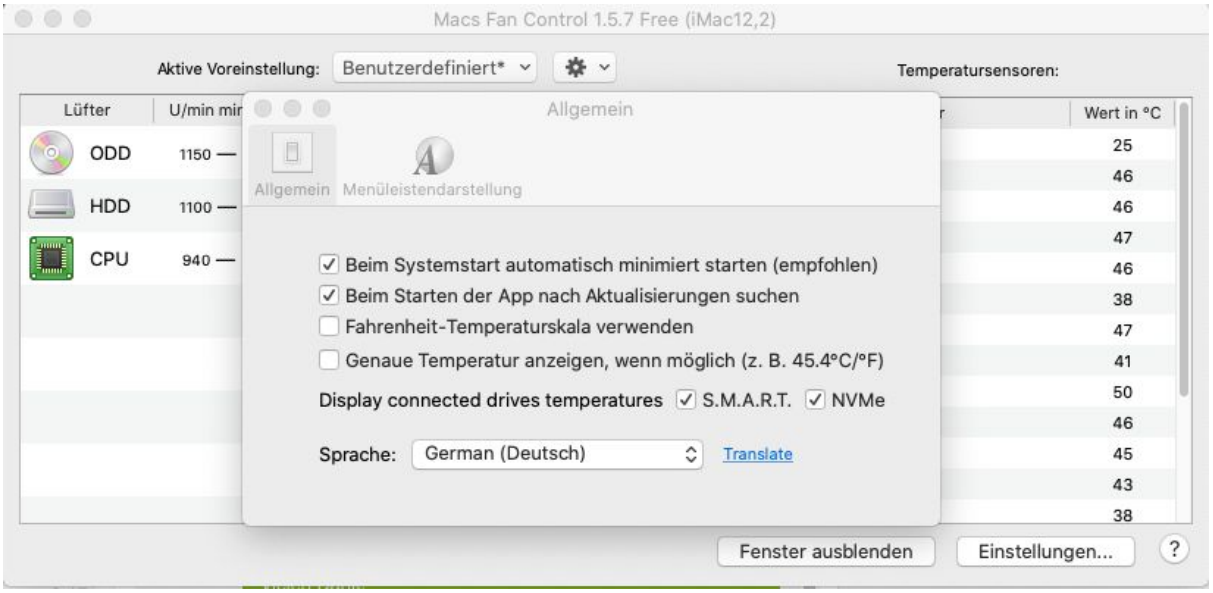
HDD: (if you have installed the OWC sensor you do not need this)



CPU:



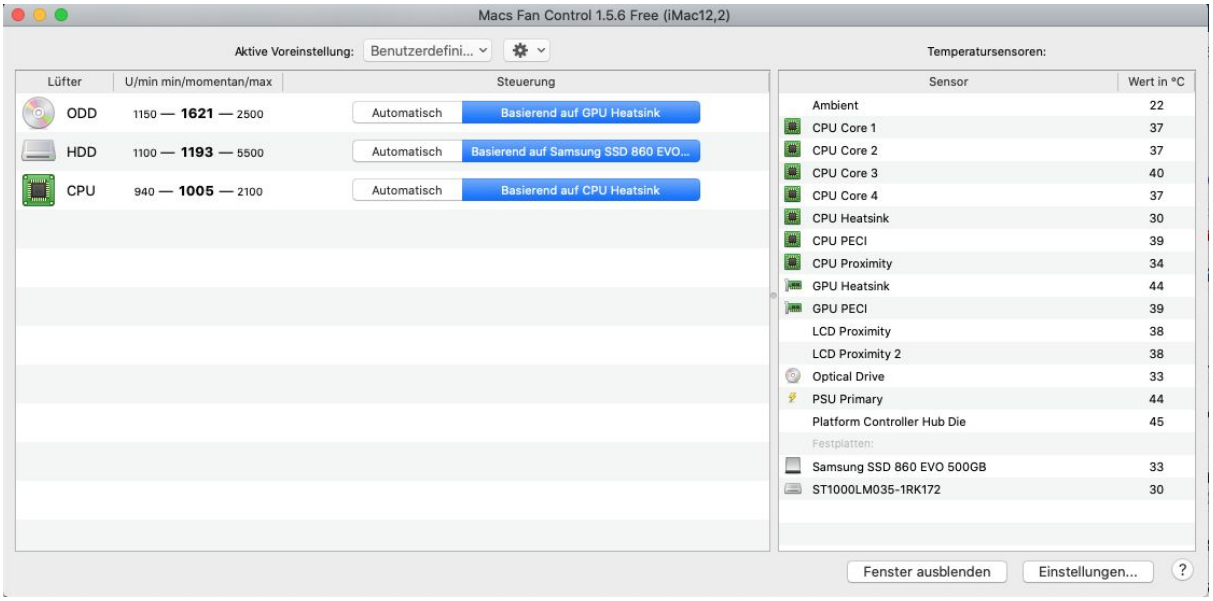
Automatic start on login:



Controlling the temperature of the machine is a complex task. While normal use never let the system run into the limits some hours of gaming might do this. If you know in advance this is coming ramp up the fans manually. Do not wait until the sink and components became so hot that even a fan at maximum cannot transport the heat out of the machine. You cannot cheat physics. Only with more physics.

You may chose also lower maximum values. Here at home we have barely more than 20 degrees room temperature, except in hot summers. Climate change is coming, but probably this iMac will not face it at the full extend.

Settings overwiew:



17. Finale

Please post your success and experiences in a brief message in our thread. Do not forget to describe your hardware settings.

Extra step: Tired of looking at the hidden files?

Just use the key shortcut and press **Cmd+Shift+.** again or if you made it persistent open the Terminal App and enter the command line followed by pressing the enter key:

defaults write com.apple.finder AppleShowAllFiles FALSE; killall Finder