

# Optimize 10th Gen Intel i5/i7/i9 CPU Power Management

For 10th gen Intel CPUs, the iMac20,2 SMBIOS is best suited, since these models are equipped with i7/i9 CPUs. If you are using an i5, you should use iMac20,1 instead.

Since I use an i9 CPU, I use iMac20,2. The system runs smoother when using iMac20.2 instead of iMac19.1. The performance is also better and the idle frequency is lower. But it can be lowered even further with the help of CPUFriendFriend. (Click on »Code« and select »Download zip«).

However, this optimization has to be performed on the each machine individually depending on the CPU - unless you are using an i9 10850K CPU as well. In this case you just have to enable CPUFriend and CPUFriendDataProvider.kext in the config.plist. Otherwise you have to generate your own CPUFriendDataProvider.kext suited for your CPU.

To do so, we first verify the current board ID by executing the following command in terminal:

```
ioreg -l | grep -i board-id
```

**Result** for iMac20,2 should be:

```
| "board-id" = <>Mac-AF89B6D9451A490B<>
```

**Result** For iMac20,1 should be:

```
| "board-id" = <>MMac-CFF7D910A743CAAF<>
```

If your result differs, check if PlatformInfo > Generic > SystemProductName is set to either iMac20,1 or iMac20,2 correct it and reboot to apply the new SMBIOS.

## Using CPUFriendFriend

Next, we unpack CPUFriendFriend and run CPUFriendFriend.command. You should see the following prompt:



```
steezonics — CPUFriendFriend.command — Python • CPUFriendFriend.command...
#####
#                               #
#####

Current Board:  Mac-AF89B6D9451A490B
Current SMBIOS:  iMac20,2

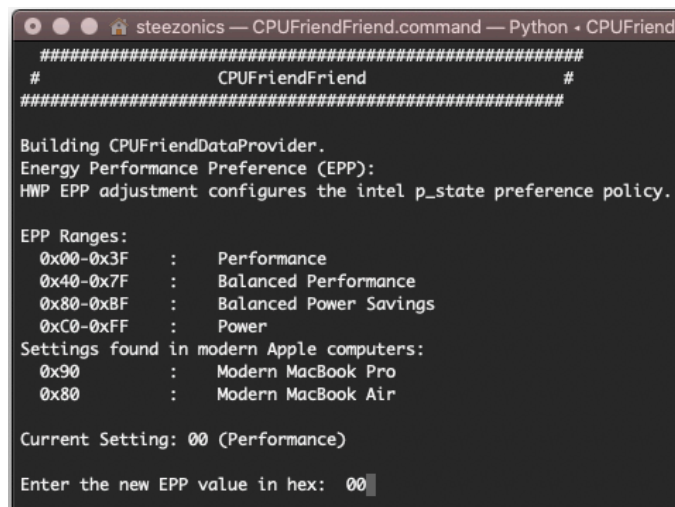
Current Frequency Vector:

1 of 1: 08 (800 MHz)

Enter the new min hex freq (800Mhz would be 08, 1300Mhz would be 0D):

Wir tragen 08 ein für 800 mHz im Idle-Betrieb
```

In the next window, we enter the Energy Performance Preference (EPP) as a hexadecimal value. This describes how fast it scales from the lowest to the highest Turbo frequency, which has an impact on the power consumption. There are 4 options available: **0x00**, **0x40**, **0x80** and **0xC0**. Pick a value which best suits your use case.



```
steezonics — CPUFriendFriend.command — Python • CPUFriendFriend.command...
#####
#                               #
#####

Building CPUFriendDataProvider.
Energy Performance Preference (EPP):
HWP EPP adjustment configures the intel p_state preference policy.

EPP Ranges:
0x00-0x3F : Performance
0x40-0x7F : Balanced Performance
0x80-0xBF : Balanced Power Savings
0xC0-0xFF : Power

Settings found in modern Apple computers:
0x90 : Modern MacBook Pro
0x80 : Modern MacBook Air

Current Setting: 00 (Performance)

Enter the new EPP value in hex: 00
```

Next, you have to specify the performance bias, which is used to set the general bias of the system between performance and energy efficiency.

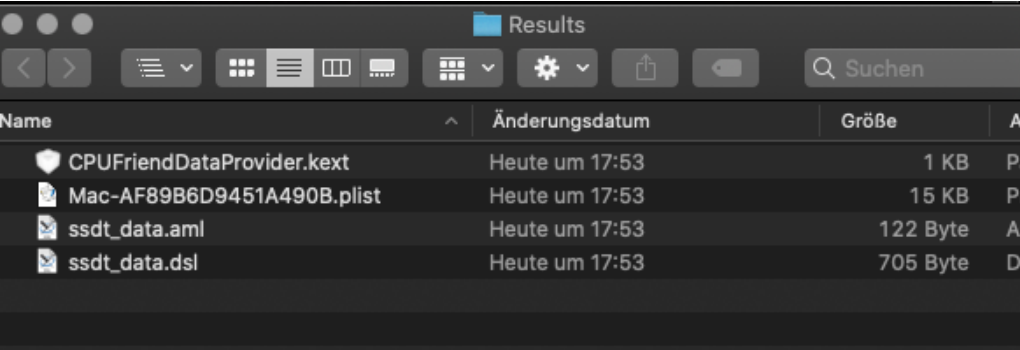
The scale ranges from 00 (performance) to 15 (maximum power saving). Since this is more relevant for notebooks than an i9 workstation, I have set the value to 0, but you are welcome to try other values.

After setting the desired power bias, the frequency vectors are extracted from the .plist associated with your board ID, modified and the several files are created. Among them »ssdt\_data.aml« as well as the desired »CPUFriendDataProvider.kext«.

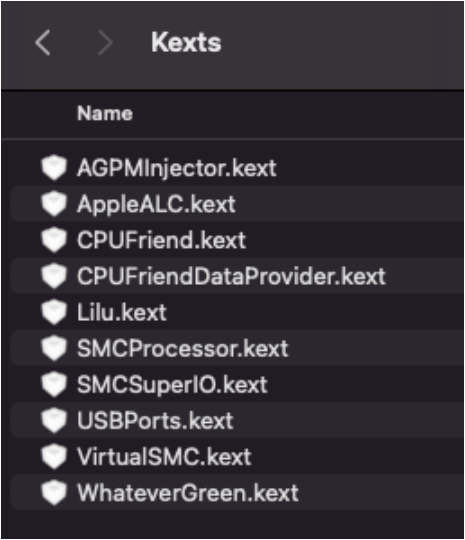
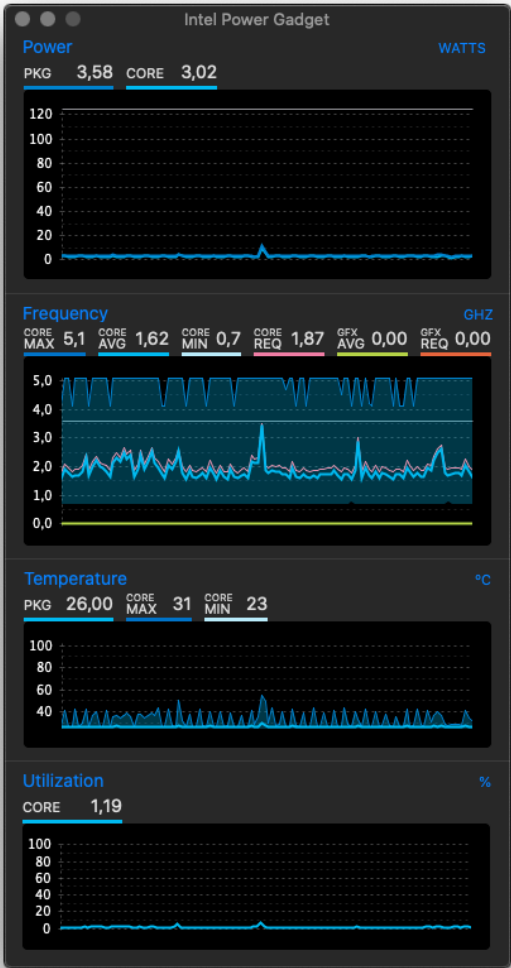
We copy this kext together with CPUFriend.kext into the kext folder of OpenCore, create a new snapshot of the config using ProperTree and restart.

Next, download, install and run IntelPowerGadget. Observe the frequency graph. Both, **CoreMax** (top line) and **CoreAvg** (jagged blue line) should tend to move downwards if the computer is idling, whereby the upper line can only drop as low as the solid straight line (= base frequency – in my case 3.6 GHz), which means that the CPU is not boosting. At the lower end of the scale, **CoreMin** should be below 1 GHz, since we entered 800 MHz as the LFM value. In this case it is even lower – 700 MHz. Thus, the CPU power management is working fine.

If the frequency is never below the base frequency or permanently above it, something is probably wrong with the power management – unless you’ve modified the CPU parameters in the BIOS by disabling speed step or overclocking all cores, etc.



Files generated by CPUFriend. They are located inside the CPUFriendFolder Folder



This is how your Kext Folder should look like