

External NVIDIA Graphics on macOS Sierra

Thunderbolt 3, Thunderbolt 2 and Thunderbolt Macs

The Sonnet eGFX Breakaway Box is Thunderbolt certified for Windows and macOS, is certified for external graphics under Windows 10, but not yet certified for external graphics under macOS. Nevertheless, we understand that many users have experienced success using the Sonnet eGFX Breakaway Box for external graphics and/or CUDA with macOS Sierra. The information regarding how to do this is readily available on the internet, and to help manage our support load, Sonnet has organized what we consider to be the most accurate of the information available in this installation guide. Note that you will not be able to obtain support from Apple or NVIDIA for external graphics under macOS at this time. If you have any issues using any Sonnet product, please contact Sonnet customer service at support@sonnettech.com.

INSTALLATION GUIDE

1. Check that you have a Macintosh compatible with external Graphics. *Except for Mac mini Mid-2011 with AMD Radeon HD 6630M GPU and 27-inch Retina 5K iMacs*, Thunderbolt 3, Thunderbolt 2 and Thunderbolt Macs are compatible with an external graphics card. If you have a Thunderbolt 2 or Thunderbolt Mac, you will also need an [Apple Thunderbolt 3 \(USB-C\) to Thunderbolt 2 Adapter](#). (This Adapter is reversible and will also work from a Thunderbolt 2 Mac to a Thunderbolt 3 peripheral.) How will Thunderbolt revision of your Mac affect gaming performance? Typically not much. For example, running a Heaven benchmark with an NVIDIA GeForce GTX 1060, Quality: Ultra; Tessellation: Extreme; Anti-Aliasing: x8; on a 1080p monitor, the results were:

Thunderbolt 3	55.3 fps
Thunderbolt 2	54.3 fps
Thunderbolt	51.8 fps

2. Choose a compatible NVIDIA graphics card:

NVIDIA GeForce GTX Titan Xp (Pascal)	NVIDIA GeForce GTX Titan X (Maxwell)
NVIDIA GeForce GTX 1080 Ti	NVIDIA GeForce GTX 980 Ti
NVIDIA GeForce GTX 1080	NVIDIA GeForce GTX 980
NVIDIA GeForce GTX 1070	NVIDIA GeForce GTX 970
NVIDIA GeForce GTX 1060	NVIDIA GeForce GTX 960
NVIDIA GeForce GTX 1050 Ti	NVIDIA GeForce GTX 950
NVIDIA GeForce GTX 1050	NVIDIA GeForce GTX 750 Ti
NVIDIA Quadro P6000	NVIDIA GeForce GTX 750
NVIDIA Quadro P5000	
NVIDIA Quadro P4000	

3. Choose the Breakaway Box model that has enough power for your specific card by checking the [Sonnet Graphics Card Power Compatibility](#) list.

4. Update to the latest version of macOS Sierra—currently 10.12.6.
 - a. *[Note: If and when you update to the next minor release of macOS (potentially 10.12.7), you will need to uninstall and reinstall the software as outlined in Step 15.]*
 - b. *[Note: Do not update to macOS 10.13 (High Sierra) until compatibility is established.]*
5. Make a Time Machine backup of your boot drive.
6. Disable System Integrity Protection (SIP). [Note: Apple includes SIP in macOS 10.12 to make your system more secure. The installation script needs SIP disabled to allow the system to make the needed changes to support external graphics. With SIP disabled, your system will be no less secure than macOS 10.10, which does not have SIP.]
 - a. From the **Apple** menu, select **Restart...**
 - b. Boot into the macOS Recovery partition on an internal drive. Hold down **command-R** on your keyboard immediately after pressing the power button to turn on your Mac, or immediately after your Mac begins to restart. Continue holding until you see the Apple logo or a spinning globe. Startup is complete when you see the macOS utilities window on an internal drive. *[Note: Booting into a Recovery System on an external drive may not be successful in disabling SIP.]*
 - c. From the **Utilities** menu, select **Terminal**.
 - d. Type `csrutil disable` and press **return**.
 - e. Close the **Terminal** app.
 - f. From the **Apple** menu, select **Restart**.
 - g. Launch **Terminal** (in the Applications:Utilities folder).
 - h. Type `csrutil status` and press **return**.
 - i. If you see **System Integrity Protection status: Disabled**, then you were successful.
 - j. **Shut Down** your Mac.
7. Connect the Sonnet eFGX Breakaway Box to your Mac.

If you have a **Thunderbolt 3 Mac**, Connect the Sonnet eGFX Breakaway Box to the Mac's Thunderbolt 3 port using the included Thunderbolt 3 cable.

If you have a **Thunderbolt 2 or Thunderbolt Mac**, plug the Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter into the Mac's Thunderbolt port, and connect the included Thunderbolt 3 cable between the Breakaway box and the Adapter.

If you have a **Mac Pro**, plug the Apple Thunderbolt 3 (USB-C) to Thunderbolt 2 Adapter into one of the Mac Pro's *bottom* Thunderbolt 2 ports, and connect the

included Thunderbolt 3 cable between the Breakaway box and the Adapter. [Note: Unless you plug into a bottom Thunderbolt port, it will not work.]

8. Turn on the power switch to the Breakaway Box. [Note: You will not be able to hot-plug the Sonnet eGFX Breakaway Box to your Mac while it is running. In other words, you must shut down to connect or disconnect the Breakaway Box. If you hot-unplug the Breakaway Box, you will crash your system.]
9. Boot your computer and install the software to support external graphics per the [license agreement](#).

- a. Make sure you have an internet connection.
- b. Run **Terminal** (in the Applications:Utilities folder).
- c. Copy and paste each line *separately* into a **Terminal** window, pressing return after each line. Follow the script instructions as it executes.

```
cd ~/desktop
curl -o automate-eGPU.sh https://raw.githubusercontent.com/goalque/automate-eGPU/master/automate-eGPU.sh
chmod +x automate-eGPU.sh
sudo ./automate-eGPU.sh
```

When the process is complete, you will get the message, “All Ready. Please restart the Mac.”

- d. Close the **Terminal** app.
 - e. From the **Apple** menu, select **Shutdown**.
10. Set up your monitor(s). Internal/ built-in video is not accelerated by the external graphics card.

If you have a **MacPro** or **mac Mini** and you want to connect all your monitors to the external graphics card, do so now. Boot macOS. You will not see any boot information until the login screen is ready. Be patient. [Note: If you have an **NVIDIA** card, and you keep one monitor attached to the built-in video port while booting, then you unplug that monitor, all other screens will go black. You can recover by reconnecting that monitor.]

If you have a **MacBook Pro**, **MacBook Air**, or **iMac**, boot macOS.

If you have a **MacBook Pro (12,1 Early 2015)**, you will need perform a timed plug-in. Disconnect the eGFX Breakaway Box Thunderbolt cable from the MacBook Pro. Start to boot. Plug in the cable when the login window appears (although some users report plugging in after the Apple logo appears works), and your system will recognize the eGPU.

11. Set the external monitor as the main monitor to obtain graphics acceleration for games and many applications. Open **System Preferences:Displays**, select **Arrangement** and drag the menu bar to the external monitor. Drag the monitors to mimic the physical arrangement.

12. Prevent your computer from turning off high-performance graphics while connected to the Breakaway Box. Open **System Preferences:Energy Saver**. Uncheck **Automatic graphics switching**. This prevents your Mac from turning off the external GPU.
13. Do not put your Mac to sleep. Your Mac will not gracefully recover from sleeping with NVIDIA external graphics attached.
14. Prevent your computer from sleeping automatically.

If you have a **MacBook Air** or **MacBook Pro**,

- i. Open **System Preferences**. Select **Energy Saver**. Select the **Power Adapter** tab and check **Prevent computer from sleeping when the display is off**.
- ii. If you plan to run external graphics while on battery power, select the **Battery** tab and slide the **Turn display off after** slider to **Never**.

If you have a **MacPro**, **Mac mini**, or **iMac**

Open **System Preferences**. Select **Energy Saver**. Slide the **Computer sleep** slider to **Never**.

15. If you want to use CUDA acceleration, download and install the Latest Version [NVIDIA CUDA drivers for Mac](#). To check that you have the latest version, open **System Preferences:Cuda** and check for updates. Set your application preferences appropriately. *[Note: Some applications (such as Adobe Premiere Pro, Adobe After Effects, Blender, Divinci Resolve, Octane Render, PhotoZoom) provide you with the option of selecting the external GPU for acceleration without using an external monitor.]* You can check your CUDA performance with the information utility [CUDA-Z](#).
16. **If and when you upgrade from 10.12.6 to 10.12.7, you need to uninstall the software before upgrading, and reinstall the software after upgrading.**
 - a. Uninstall the software. To uninstall, copy and paste each line into the **Terminal** window, pressing return after each line.

```
cd ~/desktop
curl -o automate-eGPU.sh https://raw.githubusercontent.com/goalque/automate-eGPU/master/automate-eGPU.sh
chmod +x automate-eGPU.sh
sudo ./automate-eGPU.sh --uninstall
```
 - b. If prompted, uninstall the graphics driver.
 - c. Restart.
 - d. Upgrade to 10.12.7
 - e. To re-install, copy the following into the terminal window, and press return.

```
cd ~/Desktop && sudo ./automate-eGPU.sh
```
 - f. Restart
17. A few more things to note...
 - a. Closed clamshell mode is not supported.
 - b. HDMI audio is not supported.
 - c. The internal video of Thunderbolt 3 Macs may show artifacts at the edges.

18. Visit our Breakaway Box blog on our Facebook page at <https://www.facebook.com/SonnetTech/>

TROUBLESHOOTING

External Monitor Has Black Screen

Check whether you plugged in the auxillary power connector(s) to the top (or sometimes rear) of the external graphics card. [*Note: If your NVIDIA card is identified as “NVIDIA Chip Model”, then you have failed to plug in the auxillary power connector(s).*]

Monitor’s Full Resolution Does Not Seem to Be Available

Open **System Preferences:Monitors**. Option-click the **Scaled** button. All the available resolutions should appear.

External Monitor has White Noise

Unplug and re-plug monitor cable to external graphics card.

External graphics stops working

Restart. If that doesn’t fix the issue, uninstall and reinstall the software. To uninstall, copy and paste each line into the **Terminal** window, pressing return after each line.

```
cd ~/desktop
curl -o automate-eGPU.sh https://raw.githubusercontent.com/goalque/automate-eGPU/master/automate-eGPU.sh
chmod +x automate-eGPU.sh
sudo ./automate-eGPU.sh --uninstall
```

When prompted, uninstall the NVIDIA graphics driver.
Restart.

To re-install, copy and paste the following into the **Terminal** window and press **return**.

```
cd ~/Desktop && sudo ./automate-eGPU.sh
```

Restart.
