

# External NVIDIA Graphics on macOS Sierra

Support for external NVIDIA Graphics on macOS Sierra is not certified and is not supported by Apple or NVIDIA. 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. Apple has not announced support for Thunderbolt 2 or Thunderbolt Macs, so in the future, you may need to upgrade to a Thunderbolt 3 Mac to continue to enjoy external graphics. If you have any issues using any Sonnet product, please contact Sonnet customer service at [support@sonnettech.com](mailto:support@sonnettech.com). Be sure to save and attach a System Report.

## Compatible Macs

Check the eGFX Mac Compatibility chart on the last page to see whether you have a Macintosh with support for external NVIDIA Graphics on macOS 10.12.6. If you have a Thunderbolt 2 or Thunderbolt Mac, you will also need a [Thunderbolt cable](#) and 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

## Compatible NVIDIA graphics

Cards listed below are compatible with this installation procedure. Check the [Graphics Cards Power Compatibility table](#) to see whether your specific graphics card can be used with a Breakaway Box or whether it requires a Breakaway Box 550. If your card has two 8-pin auxiliary power connectors, then you need the Breakaway Box 550.

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

# Setup

1. Check that you have a compatible Mac from the table on the last page.
2. Choose the Breakaway Box model that has enough power for your specific card by checking the [Sonnet Graphics Card Power Compatibility](#) list.
3. Update to the most current version of macOS Sierra–10.12.6.

*[Note: Do not update to macOS 10.13 (High Sierra) until compatibility is established.]*

4. Make a Time Machine backup of your boot drive.
5. 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.
6. 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.]*

7. 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.*]
8. 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**.
9. 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 **Late 2013 or Mid 2014 15-inch MacBook Pro**, you may need perform a timed plug-in. Go to the [egpu.io blog](#), and scroll down to “Boot Process on macOS”.

10. 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.
11. 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.
12. Do not put your Mac to sleep. Your Mac will not gracefully recover from sleeping with NVIDIA external graphics attached.

13. 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**.

14. 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](#).

15. 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.

16. 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).]

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### **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.

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### **External Monitor has White Noise**

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

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### **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.

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### **To Uninstall the Software**

To uninstall the software, 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.

## Sonnet Technologies Breakaway Box Mac Compatibility

				macOS 10.12.6
Mac Pro	Model	Internal discrete Graphics	TB <sup>(1)</sup>	NVIDIA
Late 2013	6,1	dual AMD FirePro D300, D500 or D700	2	√ <sup>(2)</sup>
<b>MacBook Pro</b>				
13-inch, Early, Late 2011	8,1	Intel HD Graphics 3000	1	√
15-inch, Early, Late 2011	8,2	Intel HD Graphics 3000 & AMD Radeon HD 6490M, 6750M or 6770M	1	√
17-inch, Early, Late 2011	8,3	Intel HD Graphics 3000 & AMD Radeon HD 6750M or 6770M	1	√
13-inch, Mid 2012	9,1	Intel HD Graphics 4000	1	√
15-inch, Mid 2012	9,2	Intel HD Graphics 4000 & NVIDIA GeForce GT 650M	1	√
15-inch, Retina, Mid 2012, Early 2013	10,1	Intel HD Graphics 4000 & NVIDIA GeForce GT 650M	1	√
13-inch, Retina, Late 2012, Early 2013	10,2	Intel HD Graphics 4000	1	√
13-inch, Retina, Late 2013, Mid 2014	11,1	Intel Iris 5100	2	√
15-inch, Retina, Late 2013, Mid 2014	11,2 or 11,3	Intel Iris Pro 5200 & optionally NVIDIA GeForce GT 750M	2	√ <sup>(3)</sup>
15-inch, Retina, Mid 2015	11,4 or 11,5	Intel Iris Pro 5200 & optionally AMD Radeon R9 M370X	2	√
13-inch, Retina, Early 2015	12,1	Intel Iris Graphics 6100	2	√
13-inch, 2016, Two Thunderbolt 3 Ports	13,1	Intel Iris Graphics 540	3	√
13-inch, 2016, Four Thunderbolt 3 Ports	13,2	Intel Iris Graphics 550	3	√
15-inch, 2016	13,3	Intel HD Graphics 530 & AMD Radeon Pro 450, 455, or 460	3	√
13-inch, 2017, Two Thunderbolt 3 Ports	14,1	Intel Iris Graphics 640	3	√
13-inch, 2017, Four Thunderbolt 3 Ports	14,2	Intel Iris Graphics 650	3	√
15-inch, 2017	14,3	Intel HD Graphics 630 & AMD Radeon Pro 555, or 560	3	√
<b>iMac</b>				
21.5-inch, Mid 2011	12,1	AMD Radeon HD 6770M or Radeon HD 6970M	1	Unknown
27-inch, Mid 2011	12,2	AMD Radeon HD 6770M or Radeon HD 6970M	1	Unknown
21.5-inch, Late 2012	13,1	NVIDIA GeForce GT 640M or 650M	1	√
27-inch, Late 2012	13,2	NVIDIA GeForce GTX 660M, 675MX or 680MX	1	√
21.5-inch, Late 2013	14,1 or 14,3	Intel HD Graphics 4000	1	√
27-inch, Late 2013	14,2	NVIDIA GeForce GT 755M, 775M or 780M	1	√
21.5-inch, Mid 2014	14,4	Intel HD Graphics 5000	1	√
27-inch, Retina 5K, Late 2014	15,1	AMD Radeon R9 M290X or M295X	2	No
27-inch, Retina 5K, Mid 2015	15,1	AMD Radeon R9 M290	2	No
21.5-inch, Late 2015	16,1	Intel HD Graphics 6000 or Iris Pro Graphics 6200	2	√
21.5-inch, Retina 4K, Late 2015	16,2	Intel Iris Pro Graphics 6200	2	√
27-inch, Retina 5K, Late 2015	17,1	AMD Radeon R9 M380, M390, M395, or M395X	2	No
21.5-inch, Mid 2017	18,1	Intel Iris Plus Graphics 640	3	√
21.5-inch, Retina 4K, Mid 2017	18,2	AMD Radeon Pro 555 or 560	3	No
27-inch, Retina 5K, Mid 2017	18,3	AMD Radeon Pro 570, 575 or 580	3	No
27-inch, iMac Pro 2017	1,1	AMD Radeon Vega 56 or 64	3	No
<b>Mac mini</b>				
Mid 2011	5,1, 5,2 or 5,3	Intel HD Graphics 3000	1	√
Mid 2011	5,1 or 5,2	AMD Radeon HD 6630M	1	No
Late 2012	6,1 or 6,2	Intel HD Graphics 4000	1	√
Late 2014	7,1	Intel HD Graphics 5000, or Intel Iris 5100	2	√
<b>MacBook Air</b>				
11-inch, Mid 2011	4,1	Intel HD Graphics 3000	1	√
13-inch, Mid 2011	4,2	Intel HD Graphics 3000	1	√
11-inch, Mid 2012	5,1	Intel HD Graphics 4000	1	√
13-inch, Mid 2012	5,2	Intel HD Graphics 4000	1	√
11-inch, Mid 2013, Early 2014	6,1	Intel HD Graphics 5000	1	√
13-inch, Mid 2013, Early 2014	6,2	Intel HD Graphics 5000	1	√
11-inch, Early 2015	7,1	Intel HD Graphics 6000	2	√
13-inch, Early 2015	7,2	Intel HD Graphics 6000	2	√
13-inch, June 2017	7,2	Intel HD Graphics 6000	2	√

<sup>(1)</sup>√ indicates that external graphics currently works with indicated Macs. Thunderbolt 3 Macs will continue to have Apple Support for external graphics. Apple has not committed to supporting external graphics on Thunderbolt 2 and Thunderbolt Macs. To continue to enjoy external graphics in the future, you may need to upgrade to a Thunderbolt 3 Mac.

<sup>(2)</sup>Use a bottom Thunderbolt port.

<sup>(3)</sup>This Mac requires a special boot procedure. Link to the following forum and scroll down to "Boot Process on macOS".  
[https://egpu.io/forums/implementation-guides/2014-mbp-w-750m-akitio-node-w-980-ti-mac\\_editor/](https://egpu.io/forums/implementation-guides/2014-mbp-w-750m-akitio-node-w-980-ti-mac_editor/)