AMD ENDURO™ TECHNOLOGY

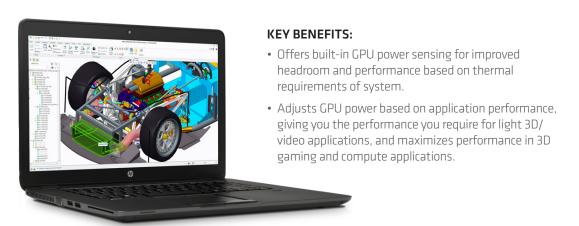## Efficiency without the sacrifice

A HOW-TO GUIDE ON MANAGING PERFORMANCE AND BATTERY LIFE ON YOUR AMD-EQUIPPED MOBILE WORKSTATION

It used to be that mobility meant sacrifice. Moving from a desktop to smaller, lighter devices required a drastic downsize in performance, in battery life, or both.

With AMD's innovations in power technology, you don't have to compromise anymore. AMD FirePro™ graphics are taking the limitations out of your mobile computing experience with intelligent power technologies that give you the best of both worlds: performance when you need it and power savings when you don't.

WHAT IS AMD ENDURO™ TECHNOLOGY?

AMD Enduro™ technology regulates your notebook's GPU to give you an instant boost in graphics performance when you need it and consumes virtually zero watts of power when you don't. Get great performance out of your battery using AMD FirePro™ professional graphics.[1,2]
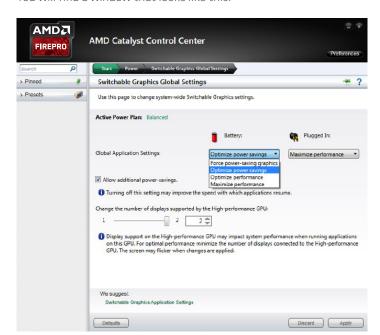
KEY BENEFITS:

- Offers built-in GPU power sensing for improved headroom and performance based on thermal requirements of system.

- Adjusts GPU power based on application performance, giving you the performance you require for light 3D/ video applications, and maximizes performance in 3D gaming and compute applications.

HOW TO USE AMD ENDURO TECHNOLOGY

Beginning with version 13.152.4 of the AMD Catalyst™ driver, you will find new features and adjustments to fine-tune performance and power savings for your applications. While most people are content with the default settings that are already in place, we also give users the ability to customize their settings to cater to their own personal requirements, whether it's increasing performance or enhancing battery life.

If your notebook is equipped with AMD Enduro technology, you can access it by right-clicking on the Windows desktop and selecting the AMD Catalyst™ Control Center.

Once the AMD Catalyst Control Center is open, you will find a Power section, and under that, select Switchable Graphics Global Settings.

You will find a window that looks like this:

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These settings control how your system will handle applications on a global scale while the system is either in battery mode or plugged in. This means if you select **"Force power-saving graphics,"** all applications will run on a power-savings mode, and if you choose **"Maximize Performance,"** all applications will run at full speed on the AMD FirePro™ discrete GPU.

When **"Optimize Power Savings"** or **"Optimize Performance"** is selected, AMD Enduro™ will decide which mode to select on an app-to-app basis, based on whichever application is currently open or in focus. For example, if **"Optimize Power Savings"** is selected, all applications will run on power savings mode, unless **"High Performance"** is selected for that particular application. If **"Optimize Performance"** is selected, known applications run at maximum performance, while unknown applications and applications will run in power savings mode when **"Power Saving"** is selected.

Quick Global Settings Summary:

APPLICATION SETTING	DESCRIPTION
Force Power Saving Graphics	• Run applications on power saving GPU, regardless of profiles.
Optimize Power Savings	• Applications "Based on Power Source" run on power-saving GPU. • Unknown applications run on power saving GPU.
Optimize Performance	• Applications "Based on Power Source" run on high-performance GPU. • Unknown applications on power saving GPU.
Maximize Performance	• Applications "Based on Power Source" run on high-performance GPU. • Unknown applications run on high-performance GPU.

SELECTING POWER OPTIONS BY APPLICATION

In the past, whenever users switched to battery mode, the performance of their notebook suffered, as performance was reduced to increase battery life. This may not be too noticeable if the user is working on a word processor or browsing the web; however, if they're using a demanding application that requires the full rendering performance of the GPU, the performance difference between battery and AC mode can be substantial.

With AMD Enduro technology, users can now change the performance behavior of their notebook at the application level. You can still have the notebook perform on battery mode for regular tasks like checking email or browsing the web, but the minute you open your CAD or M&E application, the full power of the GPU comes to life.

You can customize this mode by first ensuring that the "Switchable Graphics Global Setting" is set to either "Optimize Power Savings," or "Optimize Performance." Once one of those modes is selected, you can go to the Switchable Graphics Application Settings window that looks like the image below.

In this window, you will find a list of recent applications as well as all applications right below it. You can assign power states (High Performance, Power Saving, or Based on Power Source) to key applications, and customize the way you want apps to run on your system.

- **"High Performance"** will force the application to always run on the performance GPU if "Optimal Power Savings" or "Optimal Performance" is selected in the global options.

- **"Power Saving"** will force the application to always run on the power-saving GPU if "Optimal Power Savings" or "Optimal Performance" is selected in the global options.

- **"Based on Power Source"** will run applications based on whichever option is selected in the global options.

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OTHER AMD TECHNOLOGIES THAT HELP YOU SAVE POWER

In addition to AMD Enduro technology, AMD has other technologies that also help you save power and get the most out of your system.

AMD ZEROCORE POWER TECHNOLOGY[2]

It allows your AMD FirePro™ GPU to consume virtually no power while in idle state and also controls additional GPUs in AMD CrossFire™ technology mode to consume less when it is not in use.

KEY BENEFITS:

- Greater idle power reduction shutting down the GPU.
- Core GPU functional blocks consume 0W while the rest of the PC remains in long idle state.

AMD POWERTUNE TECHNOLOGY[2]

Intelligently monitors and manages the power draw of your AMD FirePro™ GPU to enable higher clock speeds, which provides improved performance.

KEY BENEFITS:

- Offers built-in GPU power sensing for improved headroom and performance based on thermal requirements of system.
- Adjusts GPU power based on application performance, giving you the performance you require for light 3D/video applications, and maximizes performance in compute applications or 3D rendering.

Learn more about AMD FirePro™ graphics for mobile workstations at **www.amd.com**

1. AMD Enduro™ technology automatically turns off the discrete GPU for non-intensive applications to help maximize battery life. Application enablement required; implementation varies by application and operating system. Supported by Windows® 7 and Windows 8 Standard and Professional editions; Linux OS supports manual switching between graphics solutions which requires restart of X-Server. Certain video and display features may not be available when the discrete GPU is turned off. Available with select AMD FirePro™ or AMD Radeon™ discrete graphics cards when combined with integrated graphics or APU graphics. Check with your system manufacturer for specific capabilities and supported technologies.

2. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain AMD FirePro™ products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions. Not all products feature all technologies – check with your component or system manufacturer for specific model capabilities.

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