White Paper | AMD Eyefinity Multi-Display Technology

Table of Contents

INTRODUCTION .................................................. 2
What is AMD Eyefinity Multi-Display Technology? .............................................................. 2
AMD Eyefinity Technology System Requirements .......................................................... 3
AMD Eyefinity Technology Usage Scenarios .............................................................. 4
Display Combinations ........................................... 6
Productivity .......................................................... 6
Financial .................................................................. 8
Medical ................................................................. 8
Public Information Display ........................................... 9
Gaming ................................................................. 9
EcoSystem .......................................................... 12
DisplayPort Dongles .................................................. 13
AMD Eyefinity Technology Updates .......................................................... 13
Looking Forward ................................................ 14

March 1, 2012
AMD Eyefinity advanced multiple-display technology launches a new era of panoramic computing, helping to boost productivity and multitasking with innovative graphics display capabilities supporting massive desktop workspaces, creating ultra-immersive computing environments with super-high resolution gaming and entertainment, and enabling easy configuration and supporting up to six independent display outputs simultaneously.

**Introduction**

In the past, multi-display systems catered to professionals in specific industries. Financial, gas and oil, and medical are just some industries where multi-display systems are not only desirable, but a necessity. Today, even graphic designers, CAD engineers and programmers are attaching more than one display to their workstation. A major benefit of a multi-display system is simple and universal – it enables increased productivity. This has been demonstrated in an industry study which has shown that attaching more than one display device to a PC can help increase user productivity.

Early multi-display solutions were non-ideal. Bulky CRT monitors claimed too much desk space, thinner LCD monitors were very expensive, and external multi-display hardware was inconvenient and expensive. These issues are much less of a concern today. Today, LCD monitors are very affordable and current generation GPUs can drive multiple display devices independently and simultaneously, without the need for external hardware.

Despite the advancements in multi-display technology, AMD engineers still felt there was room for improvement, especially regarding the display interfaces. VGA carries analog signals and needs a dedicated DAC per display output, which consumes power and ASIC space. Dual-Link DVI is digital, but requires a dedicated clock source per display output and uses too many IO pins from our GPU. If we were to overcome the dual display per GPU barrier, it was clear that we needed a superior display interface.

**What is AMD Eyefinity Technology?**

AMD Eyefinity Technology provides advanced multiple monitor technology delivering an incredibly immersive graphics and computing experience with innovative display capabilities, supporting massive desktop workspaces and super-high resolution gaming environments.

Many legacy GPUs support up to two display outputs simultaneously and independently, and have done so for more than a decade. Until now, the most common way to support more than two monitors at the same time was to combine multiple GPUs on a single graphics card. Beginning with the ATI Radeon™ HD 5000 Series, and every generation of discrete GPU product thereafter, AMD has equipped its GPUs with the advanced capability of simultaneously supporting up to six independent display outputs.

**Immersive Panoramic Computing**

AMD Eyefinity multi display technology offers:

- Extreme multiple monitor support enabling enhanced productivity for commercial and workstation solutions, and a truly immersive visual experience in home entertainment
- Operate multiple displays independently or create one massive display surface spanning multiple monitors

In 2004, a group of PC companies collaborated to define and develop DisplayPort, a powerful and robust digital display interface. At that time, engineers working for the former ATI Technologies Inc. were already thinking about a more elegant solution to drive more than two display devices per GPU, and it was clear that DisplayPort was the interface of choice for this task.

In contrast to other digital display interfaces, DisplayPort does not require a dedicated clock signal for each display output. In fact the data link is fixed at 1.62Gbps or 2.7Gbps per lane, irrespective of the timing of the attached display device. The benefit of this design is that one reference clock source can provide the clock signals needed to drive as many DisplayPort display devices as there are display pipelines in the GPU. In addition, with the same number of IO pins used for Single-Link DVI, a full speed DisplayPort link can be driven which provides more bandwidth and helps translate to higher resolutions, refresh rates and color depths. All these benefits perfectly complement AMD Eyefinity Multi-Display Technology.
Expansive Desktop Space for Enhanced Productivity

- Delivers a massively immersive workspace, helping you to be more productive
- The perfect solution for office productivity, making multi-tasking easier, keeping all your critical data right at your finger tips

Multi-Display Flexibility and Upgradability

- Incredible expansion by adding multiple monitors
- Expand the immersive panoramic experience with multiple GPUs

AMD Eyefinity multi-display technology is an exciting step forward in immersive computing on a PC. Running up to six DisplayPort monitors is a stunning way to immerse yourself in the latest PC games or to visualize a large display surface. This new feature enables high-profile consumer and business scenarios that highlight ongoing innovation in advancing visual immersion.

AMD Eyefinity technology offers consumers the flexibility to expand their system and experience on their own schedule. They can purchase one display now and add on additional monitors as their budget permits. AMD next generation graphics products currently offer a tremendous feature set, and new products always take into account the upgrade path so that in the future a consumer can take advantage of the latest technologies to the greatest extent possible. Also, from a cost perspective, it is currently less expensive to buy multiple panels and get higher resolution gaming than it is to buy one large, high resolution monitor. As of Q3 2011, it is not uncommon for 21.5 inch DisplayPort monitors* to sell for as low as $200 USD each, meaning that a three panel configuration would cost around $600 USD. This is far below the price of a single, large display with similar resolution. Also, with AMD Eyefinity technology, you can take advantage of a flexible upgrade path.

**AMD Eyefinity Technology System Requirements**

The following chart shows the key requirements of a system that can take full advantage of AMD Eyefinity technology:

- AMD Eyefinity capable graphics card
- A set of displays
- PC with Microsoft Windows Vista or Windows 7
- AMD Eyefinity system

**The combination of displays that can be used in an AMD Eyefinity technology-enabled system depends on the types of display connections and dongles/adapters used with the graphics card.


**The combination of displays that can be used in an AMD Eyefinity technology-enabled system depends on the types of display connections and dongles/adapters used with the graphics card.
Technical Details

Number of Monitors:
→ Up to six, depending on system configuration.

Aggregate Screen Resolution:
Maximum Resolutions:
→ AMD Radeon™ HD 6800 Series graphics: up to 16384 x 16384 (268.4 megapixel resolution)
→ ATI Radeon™ HD 5000 Series graphics: up to 8192 x 8192 (67.1 megapixel resolution)

Examples:
→ 4800 x 2560 resolution grouping three displays wide x one display high, with portrait orientation, using 2560x1600 display resolution for each monitor (12.3 megapixel resolution)
→ 7680 x 3200 resolution grouping three displays wide x two displays high, with landscape orientation, using 2560x1600 display resolution for each monitor (24.6 megapixel resolution)

Monitors:
→ DisplayPort connections are highly recommended because they can offer optimal flexibility with the highest number of display outputs.
→ Two display outputs of either DVI, HDMI, or VGA can be combined with DisplayPort outputs to run up to a total of six monitors per GPU.

Operating Systems:
→ Microsoft Windows® 7
→ Microsoft Windows Vista®
→ Linux®

Hardware:
→ AMD Radeon™ GPU with support for Microsoft DirectX 11, with appropriate display outputs using AMD CrossFire™ Technology.
→ AMD CrossFire technology can be used to combine the horsepower of two graphics cards to drive AMD Eyefinity technology for gaming. The monitors in a Display Group must all be connected to the same graphics card, while the second graphics card is used for rendering.

Bandwidth Requirements:
→ Conditional on monitor resolution. Increased resolution requires a higher performance GPU.

AMD Eyefinity Technology Usage Scenarios

AMD Eyefinity technology is defined as two or more display outputs operating simultaneously and independently from each other. Support is available for Duplicated (Clone) and Extended multiple monitor modes, with new support for the capability to group displays into a massive single large surface spanning across multiple displays for use with your desktop workspace, video playback, with support for both windowed and full screen 3D applications.

Below are some key usage scenarios:
AMD Eyefinity Technology Connectivity Examples

The following provides visual examples of which display connections on a graphics card can be used to configure an AMD Eyefinity system.

Example 1: Support for Three Displays

Example 2: Support for Three Displays

DisplayPort connection or active DisplayPort dongle (pictured below) must be used.

Only two of these three display connections can be used.

Both HDMI and DVI connections can be used natively or with the appropriate display adapters.

Example 3: Support for up to Six Displays

Up to two legacy (DVI/HDMI/VGA) displays can be supported using passive DisplayPort dongles. The remaining four connections must be native MiniDP or via active MiniDP to DVI/HDMI/VGA dongles.
Display Combinations

AMD Eyefinity Technology is closely aligned with AMD's DisplayPort implementation, providing the flexibility and upgradability modern users demand. Up to two DVI, HDMI, or VGA display outputs can be combined with DisplayPort outputs for a total of up to six monitors, depending on the graphics card configuration.

The following table lists the most commonly used display configurations for select AMD Radeon™ GPUs.

<table>
<thead>
<tr>
<th>AMD Eyefinity Technology Setup</th>
<th>Display 1</th>
<th>Display 2</th>
<th>Display 3</th>
<th>Display 4</th>
<th>Display 5</th>
<th>Display 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Displays</td>
<td>DVI</td>
<td>VGA</td>
<td>DisplayPort</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3 Displays</td>
<td>DVI</td>
<td>HDMI</td>
<td>DisplayPort</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3 Displays</td>
<td>DVI</td>
<td>DVI</td>
<td>MiniDP</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>4 Displays</td>
<td>DVI</td>
<td>VGA</td>
<td>DisplayPort</td>
<td>DisplayPort</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>4 Displays</td>
<td>DVI</td>
<td>HDMI</td>
<td>DisplayPort</td>
<td>DisplayPort</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5 Displays</td>
<td>DVI</td>
<td>DVI</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>N/A</td>
</tr>
<tr>
<td>5 Displays</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>N/A</td>
</tr>
<tr>
<td>5 Displays</td>
<td>DVI</td>
<td>HDMI</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>N/A</td>
</tr>
<tr>
<td>6 Displays</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
<td>MiniDP</td>
</tr>
</tbody>
</table>

Note: DisplayPort and MiniDP connections can be substituted with any other display connection type (DVI, HDMI, or VGA) with the use of an active DisplayPort dongle.

Productivity

Improving employee productivity is always an ongoing key goal for any organization. Computers have become critical to workforces with desktop real estate management a key area of improvement over the last few decades.

A research study undertaken by The Pfeiffer Group in 2005 found that under certain conditions efficiency gains of up to 65% can be achieved using larger monitors with higher resolutions. These gains can be seen in many varied markets including general office productivity, digital imaging, and video. The Pfeiffer report also suggests that large display resolutions could lead to a yearly return on investment of thousands of dollars when measured in terms of increased productivity.

Microsoft researchers discovered that using a multiple monitor configuration was one of the easiest ways to optimize productivity, with gains of up to 50%. It was noted that with “overwhelming consensus” once a user switches to multiple monitors they will never switch back to using only a single monitor.2,4
How can more displays and more desktop real estate improve my efficiency?

The more screen real estate you have with multiple monitors and larger resolutions the more data and applications that can be displayed and seen at once.

Imagine opening a spreadsheet with many columns and rows. If a user tries to view this on a single monitor they have to either scale the text down or scroll continually through the data. There are many productivity benefits.

- With multiple monitors you may be able to work on the entire document visualizing all the data at once with many more ways to view the things being worked on.
- Comparison of data becomes much easier without the need to continually scroll through the document.
- Running multiple applications such as email, web browser, word processor, and spreadsheet at the same time becomes much more efficient helps improve accuracy as data is visualized simultaneously without the need to constantly alt-tab between applications.
- Menus and toolbars can stay onscreen at the same time while retaining a large viewport or multiple viewports. A larger viewport equates to fewer mouse clicks and reduces the time it takes to search data when working with many applications at once.
- With a larger resolution desktop much more of any document, spreadsheet, dataset, model or image can be viewed. Six 30" monitors with each offering up to 2560x1800 pixels of resolution, or 4.1 megapixels each, can be configured as a group consisting of three monitors wide by two monitors high giving the user a single large aggregate desktop surface with a pixel resolution of up to 7680x3200. This is the equivalent of 24.6 megapixels of screen real estate!

Switching to multiple monitors and using a larger desktop footprint can also allow users to see more of any document or image natively, thereby allowing users to work more efficiently on the dataset by taking greater advantage of their peripheral vision. This can dramatically improve the ability to multitask across many applications simultaneously.

The benefits to using AMD Eyefinity Technology in the workplace are obvious, extensible and immediately useful in improving user productivity and efficiency.
Commercial & Workstation
AMD Eyefinity technology provides the commercial and workstation customer new levels of functionality across a range of different segments.

Financial
AMD FireMV™ and AMD FirePro™ graphics accelerators have been deployed in some of the largest trading floor in some of the largest financial enterprises. AMD Eyefinity technology can offer these users new solutions to problems that continue to persist in their environment by allowing them to take advantage of multi-monitor set ups.

A Major Concern: Total Site Power Consumption
Power usage per trader is a constant struggle for trading floor IT managers. Usually located in dense urban centers in dense office towers, these traders can often be packed several hundred per floor. The never ending demand for more power and more tools require the IT manager to be able to provide that floor with an ever increasing power load. Very often the power mains to a floor or a building or a city section cannot keep up with this demand. This can limit growth for these companies.

The Solution: AMD Eyefinity Technology
In the past, the majority of quad monitor users used two dual output cards (each a "dual card") rather than one single quad output card. AMD is changing the game by offering cost-effective quad output card solutions. For large enterprise deploying one card in a system rather than two, this can lead to the following benefits:
- Easy and quick install
- Fewer PCIe slots used or needed, which can lead to a smaller system taking up less space
- Fewer cards to stock as replacements
- Low MTBF for the solution (i.e. two cards represent two potential points of failure rather than one)

Medical
The medical diagnostic workstation user is among the most demanding in terms of image quality and stability. As such, these users have some unique needs that can be addressed with AMD Eyefinity technology.

Usage Model
A typical medical diagnostic setup involves two specialty high resolution medical displays to examine medical imagery such as x-rays, CT Scan, PET scan images, etc. These systems often have a third, lower resolution monitor to display the controls for the image application itself. This power this setup, one typically would need a high end graphics card tuned specifically for the medical displays, plus a second entry level workstation card to handle the third screen.

Using AMD Eyefinity Technology
AMD plans to leverage its current medical hardware and software driver features into an integrated high end triple output medical graphics card capable to taking advantage of AMD Eyefinity technology. AMD FirePro™ graphics accelerators are currently being designed with three display outputs in order to drive the same kinds of systems as described above - two outputs to drive the high resolution 3D displays, while a third output to drive the monitor showing the application controls.

By combining all of this functionality in one card with AMD Eyefinity technology, AMD is seeking to allow medical professionals to realize the following benefits:
- Saved cost of buying two cards
- Reduced inventory of backup or supply cards
- Shortened the qualification cycle of new products (only need to qualify one card instead of two or more)
- Simplified shipping and installation
Public Information Display
The public information display market has been creeping its way into more and more retail outlets, restaurants and common areas. This market is defined by multiple screens being controlled by a single system outputting multiple instances of active content.

AMD Eyefinity technology can help increase the capacity of a single system by allowing more data to be driven by a single graphics card. This can lead to efficiencies in installation and cost savings which helping expand content choice and flexibility.

The power of the GPU behind these multiple screens can also enable a level of 3D, video or flash activity that can easily be spanned across multiple screens or multiple zones. This can open up a new stage of dynamic eye catching content that can be the key to a successful public information display environment.

Gaming
Discover a new realm of panoramic gaming with AMD Eyefinity advanced multiple-display technology. Intensify gaming with ultra-immersive playing environments, and expand your entertainment landscape with a breathtaking field-of-view. Offering easy configuration and flexible upgradability, the innovative graphics capabilities of AMD Eyefinity multiple-display technology helps dissolve visual limitations and adds a new “surround-sight” sensation to your PC experience.

Immerse yourself in game play with AMD Eyefinity technology. Get a commanding view of the action, and enjoy more control in real-time strategy games. With AMD Eyefinity Technology, you could detect enemies sooner, react faster, and survive longer. You could see enemy aircraft with peripheral vision, and fly with greater spatial awareness in flight combat simulators. You could eliminate blind spots and feel a heightened sense of speed in racing games.

Many games offer in-game support for selecting AMD Eyefinity technology’s super-high resolutions. An example is Alan Wake running on three 1920x1200 displays configured in a 3x1 landscape display group.

Key Game Genres
Flight Simulation
Tom Clancy’s HAWX is a cinematic arcade-style flight combat game that puts you in the pilot seat of the next-generation fighters. Unlike the view from a real cockpit, a single display limits the amount of airspace you can see around you. This is why flight simulators have traditionally been one of the applications that have been targeted by multi-monitor solutions.
With display set ups capable of utilizing AMD Eyefinity technology, the gamer can see more of the sky around them, and keep an eye on the competition when they would out of sight on a single screen. This can give the gamer an edge in dogfights, allowing them to outmaneuver the competition, shoot first, and dominate the skies.

Single Display

Wider field of view lets you see enemies before they see you!

Immerse yourself in your game

First Person Shooters
First Person Shooter titles like Deus Ex: Human Revolution, Battlefield 3, and Medal of Honor are some of the most popular game genres in the world. First person shooter gamers are highly competitive, and players use whatever advantage they have to get ahead of their opponents in what is a fast-paced, action-packed environment. With a single monitor, gamer fields of view have typically been limited to a flat plane directly in front of their player. As such, players have to rotate very quickly and often to see and respond to others nearby.

By enabling more than one panel side-by-side, gamers are now able to go beyond the traditional single monitor and the field of view can be increased 3 times over. Additionally, the side monitors can be angled, allowing gamers to retain focus on the primary monitor while using the player’s peripheral visions to keep an eye on anyone approaching from the sides. This can allow them to see and respond to targets sooner, without having to constantly spin around to check their blind spots.

Racing
Racing simulations have traditionally been one of the common applications targeted towards multi-monitor set ups. The driver can become more immersed in the race and gain a broader view around their car, giving them an advantage when negotiating with tight turns, or with outmaneuvering the competition.
Implemented in Dirt 3 is the option to expand the field of view around the car, showing you what would viewable through your car’s side windows. This gives the gamer a much better view of the environment around them, letting them spin around hairpin turns, or block off other cars trying to pass them. The gamer’s central point of focus makes 3-wide configurations ideal, giving them an unobstructed view of the road ahead.

Rid Yourself of Blind Spots, Get Ahead of the Competition, Become the Driver

Real Time Strategy
Massive battles sprawling huge landscapes are the focus of real time strategy games like Total War: Shogun 2 - or Civilization V. In these games, gamers can zoom right up into a single unit, or zoom out to see their entire army. This gives direct benefit to having more display real estate since it allows the gamer to zoom out and see more of action, without losing any of the detail in the scene.

With a wider view of the playing field, gamers can be in command of larger armies and be more efficient in their strategy and tactics. Since these games do not have an inherent central focus (no crosshairs or reticules), they scale well to any multi-monitor configuration, especially the ultimate 3x2 display group.

See Massive Battlefields
Tested Games

AMD has created the AMD Eyefinity Validated and Ready program to identify and promote hardware and software that provides the best end-user experience with AMD Eyefinity Technology. In order for a game to qualify as AMD Eyefinity Validated or Ready, we require that they support a wider field of view, maintain a correct aspect ratio with minimal stretching, and ensure that visual elements such as in-game menus and HUD objects are visible, usable and free of distortion. We have created a Software Developer Kit (SDK) that makes it much easier for developers to create gaming experiences that meet these criteria. The list of games that AMD has tested under this program is maintained at http://support.amd.com/us/eyefinity/Pages/eyefinity-software.aspx.

EcoSystem

Application Support

AMD Eyefinity technology offers software developers a great ability to differentiate the visual aspects of their products by using multiple display technology. With the graphics performance capability of AMD “next generation” products it is now possible to drive extremely high resolutions with varied usage scenarios at frame rates gamers have come to expect.

For AMD Eyefinity technology, along with gaming and productivity, AMD sees the key commercial market segments being financial, medical, display signage, CAD and DCC markets. Display signage and command/control center vertical markets are already moving quickly to multiple display usage scenarios. AMD Eyefinity technology offers an economical high performance solution that’s difficult to match.

DisplayPort Monitors

AMD Eyefinity technology-enabled graphics boards should work with all DisplayPort-driven monitors, but here is a short list of 24” displays that AMD recommends for ease of use with current monitor stand offerings.

- Dell UltraSharp 2408WFP 24” Widescreen LCD Monitor
- Dell UltraSharp 3008WFP 30” Widescreen LCD Monitor
- HP LP2475w 24” Widescreen LCD Monitor
- HP LP2275w 22” Widescreen LCD Monitor
- Lenovo ThinkVision L2440x 24” Widescreen LCD Monitor
- Dell UltraSharp 2410WFP 24” Widescreen LCD Monitor
- Samsung MD230 23” Thin-Bezel Widescreen LCD Monitor

* The Samsung monitor is the recommended monitor for gaming with AMD Eyefinity technology-enabled cards. It features minimal bezel intrusion, high quality MVA LCD glass for superior viewing angle and support for both DisplayPort and DVI ports.

Monitor Stands

A good monitor stand can potentially enhance the AMD Eyefinity technology experience by providing a streamlined workspace with stable mounting options. List below are just a few of the available options.

- XFX Triple Display Monitor Stand
  http://xfxforce.com/en-us/Products/Accessories/Triple-Monitor-Stand.aspx
- Ergotech Heavy Duty Multi-Monitor Stand, WSGF Edition
- Ergotron DS100 Dual and Quad Monitor Desk Stands
  http://www.ergotron.com/Products/tabid/65/PRID/15/language/en-CA/default.aspx
- Chief MR6000B Requires up to 2 KFA325B Triple Array Bar
- Ergo In Demand
  http://www.ergoindemand.com
DisplayPort Dongles

To ensure compatibility and optimal experience with AMD Eyefinity technology, it is recommended that only AMD Eyefinity technology validated dongles be used. A brief description of DisplayPort dongle types is provided below. For a list of validated dongles, see http://support.amd.com/us/eyefinity/Pages/eyefinity-dongles.aspx.

Active Dongles

Active dongles use DisplayPort signaling to actively translate and re-transmit signals from a DisplayPort connection to a non-DisplayPort display. This type of true DisplayPort signaling allows for support of three or more displays on a single graphics card.

Passive Dongles

Connections provided by passive dongles are considered legacy connections. Therefore, unlike the connections provided with active dongles, passive dongles cannot be used to support three or more displays on a single card. This is due to the fact that passive dongles use non-DisplayPort signaling to passively translate signals from a DisplayPort connection to a non-DisplayPort display.

On the other hand, passive dongles offer an affordable solution for connecting legacy displays to DisplayPort connections. For example, when using an AMD Radeon™ graphics card where there are six miniDP connections, up to two displays can be supported using passive miniDP-to-DVI/HDMI dongles. Any additional displays can be supported only using active dongles.

DisplayPort-to-DVI Dongles

It is important to note there exist both single-link and dual-link DisplayPort-to-DVI dongles, which could limit the maximum resolution of the display. Single-link dongles allow resolutions of up to 1920x1200, while dual-link dongles allow for a full resolution of 2560x1600. DisplayPort-to-DL-DVI (dual-link DVI) dongles require an external power supply, usually provided through a separate USB connection that meets the USB “high power” specification.

AMD Eyefinity Technology Updates

AMD is a leader in multi-display technology, and has demonstrated this leadership position by providing many improvements to AMD Eyefinity Technology. Here is a list of updates since launch:

<table>
<thead>
<tr>
<th>Update</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CrossFire Support</td>
<td>Use the power of more than one GPU to power gaming in Eyefinity</td>
</tr>
<tr>
<td>Bezel Compensation</td>
<td>Compensate for discontinuity in bezel gap between monitors by hiding pixels behind the bezels. Results in a smoother gameplay experience</td>
</tr>
<tr>
<td>Per Display Color Adjust</td>
<td>Adjust color setting individually on monitors in a display group</td>
</tr>
<tr>
<td>Multiple Display Groups</td>
<td>Create more than one display groups</td>
</tr>
<tr>
<td>AMD CrossFire™ In Portrait Modes</td>
<td>Allow CrossFire to be enabled when gaming in rotated display configurations</td>
</tr>
<tr>
<td>Hydravision Enhancements 1</td>
<td>Dialog repositioning and Maximize controls</td>
</tr>
<tr>
<td>Revamped Configuration UI</td>
<td>Easily setup AMD Eyefinity technology display groups</td>
</tr>
<tr>
<td>Hydravision Enhancements 2</td>
<td>Eyefinity-aware HydraGrid</td>
</tr>
<tr>
<td>5x1 Display Configuration</td>
<td>5x1 Portrait and Landscape display group support</td>
</tr>
<tr>
<td>16K x 16K support</td>
<td>Expanded maximum resolution for AMD Eyefinity technology display groups (from 8k x 8k). Only on 6000 series and up.</td>
</tr>
<tr>
<td>Bezel Compensation Update</td>
<td>Allow bezel compensation on non-identical displays</td>
</tr>
<tr>
<td>Support for AMD HD3D Technology</td>
<td>Leverages DisplayPort technology to enable Stereo 3D gaming with AMD Eyefinity technology display groups. (AMD HD3D compatible DisplayPort 3D display required)</td>
</tr>
<tr>
<td>Custom Resolutions</td>
<td>Select a custom resolution for an AMD Eyefinity technology display group, based on the common supported resolutions of the attached displays</td>
</tr>
<tr>
<td>Task Bar Positioning</td>
<td>Position the Windows task bar on a single display in an AMD Eyefinity technology display group</td>
</tr>
<tr>
<td>Preset Manager Improvements</td>
<td>Increased stability for preset switching and better support for display groups with greater than 3 displays</td>
</tr>
</tbody>
</table>
Looking Forward

The DisplayPort 1.2 specification is currently being developed by the same group of companies who designed the original DisplayPort specification. This new spec will include exciting new features for our customers. Current plans for the feature set include higher bandwidth, enhanced audio and multi-stream support.

Multi-stream (MST), commonly referred to as daisy-chaining, is the ability to address and drive multiple display devices through one connector. This technology, coupled with AMD Eyefinity Technology, has the ability to revolutionize multi-display technology, and AMD will be at the forefront of this transition. The specification and the industry are now ready to deliver this feature in our next-generation products.

DISCLAIMER

The information presented in this document is for informational purposes only and may contain technical inaccuracies, omissions and typographical errors. AMD reserves the right to revise this information and to make changes from time to time to the content hereof without obligation of AMD to notify any person of such revisions or changes.

AMD MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE CONTENTS HEREOF AND ASSUMES NO RESPONSIBILITY FOR ANY INACCURACIES, ERRORS OR OMISSIONS THAT MAY APPEAR IN THIS INFORMATION. AMD SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

IN NO EVENT WILL AMD BE LIABLE TO ANY PERSON FOR ANY DIRECT, INDIRECT, SPECIAL OR OTHER CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF ANY INFORMATION CONTAINED HEREIN, EVEN IF AMD IS EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

This Documents contains forward-looking statements, which are made pursuant to the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements are generally preceded by words such as “plans,” “expects,” “believes,” “anticipates” or “intends.” Investors are cautioned that all forward-looking statements in this release involve risks and uncertainty that could cause actual results to differ materially from current expectations. We urge investors to review in detail the risks and uncertainties in the Company’s filings with the United States Securities Exchange Commission.

SUBSTANTIATION

1 AMD Eyefinity technology works with games that support non-standard aspect ratios, which is required for panning across multiple displays. To enable more than two displays, additional panels with native DisplayPort™ connectors, and/or DisplayPort™ compliant active adapters to convert your monitor’s native input to your card’s DisplayPort™ or Mini-DisplayPort™ connector(s), are required. SLB (Single Large Surface) functionality requires an identical display resolution on all configured displays. AMD Eyefinity technology can support up to 6 displays using a single enabled AMD Radeon™ graphics card with Windows Vista or Windows 7 operating systems - the number of displays may vary by board design and you should confirm exact specifications with the applicable manufacturer before purchase.
6 Video Electronics Standards Association (VESA): http://www.vesa.org

©2013 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, Radeon and combinations thereof are trademarks of Advanced Micro Devices, Inc. Microsoft, Windows, Windows Vista, and DirectX are registered trademarks of Microsoft Corporation in the U.S. and/or other jurisdictions. PID 51586A

©2011 The Codemasters Software Company Limited ("Codemasters"). All rights reserved. "Codemasters™", the Codemasters logo and "DIRT™" are registered trademarks owned by Codemasters. “DIRT 3™” and “EGO™” are trademarks of Codemasters. Ford Motor Company Trademarks and Trade Dress used under license to Codemasters. All other copyrights or trademarks are the property of their respective owners and are being used under license. Developed and published by Codemasters. ©EIDOS, NIOXES, Deus Ex and their logos are trademarks or registered trademarks of their respective companies. All rights reserved. SHOGUN TOTAL WAR, SHOGUN 2, SHOGUN 2 and related marks are trademarks of The Creative Assembly. All rights reserved. ©2009 Ubisoft Entertainment. All Rights Reserved. H.A.W.X. Ubisoft and the Ubisoft logo are trademarks of Ubisoft Entertainment in the U.S. and/or other countries. CRYSTAL is a trademark of Crytek GmbH. Other names are for informational purposes only and may be trademarks of their respective owners.