

VGA I DirectX 10

Kraj godine i Božićne kupovine donijeti će mnogoj djeci i nova računala. Kako su ona uglavnom namijenjena igricama, pored snage procesora najvažnija je grafička kartica. Tu male nijanse nose velike razlike u cijeni.

Pojavom prve igrice koja koristi DirectX 10 postavlja se pitanje, tko od proizvođača čipseta za grafičke kartice nudi bolje rješenje za Windows Vista operativni sustav. Da li je to Nvidia ili ATI?

Dosada kod Windows XP uz DirectX 9 poredeći GeForce 8 seriju i ATI Radeon 2 seriju prednost je bila na strani Nvidie i najjačih kartica GeForce 8800 Ultra i GTX. ATI-jev Radeon 2900 XT je bio suprostan GeForce-u 8800 GTS. Igrice kao Bioshock, Lost Planet, Company of Heroes i World in Conflict, koje su se pojavile na tržištu se mogu iskoristiti benchmark testovi. Obje kompanije su optimizirale svoje drivere baš za te igrice.

Pojava dugo najavljivane igrice Crysis iz Cryteka će opet pomjeriti granicu potrebnog hardvera pa će tako i prodavači najskupljih računala trljati ruke. Pitanje je koliko kod nas ima takvih fanova, ali mogu reći da ih je sve više i više, koji ne žale dati novce za najnovije računalo sa najjačom grafičkom u njemu. Proizvođač igrice kao minimum najavljuje

- OS - Windows XP ili Windows Vista
- Procesor - 2.8 GHz ili brži za XP ili 3.2 GHz ili brži za Vistu, Intel Core 2.0 GHz za XP ili 2.2 GHz za Vistu, AMD Athlon 2800+ za XP ili 3200+ za Vistu
- Memorija - 1.0 GB RAM za XP ili 1.5 GB RAM za Vistu
- Video kartica -256 MB NVIDIA GeForce 6800 GT ili jača ili ATI Radeon 9800 Pro (Radeon X800 Pro za Vistu)
- Hard Disk - 12GB
- Zvučna kartica - DirectX 9.0c kompatibilna
- Biti će potrebno izvršiti update drivera za grafičku karticu

Ono što se u praksi pokazalo potrebno, testirajući beta verziju je nešto drugo.

- OS - Windows XP ili Vista
- Procesor - Intel Core 2 DUO @ 2.2GHz ili AMD Athlon 64 X2 4400+
- Memorija - 2.0 GB RAM
- Video kartica - NVIDIA GeForce 8800 GTS/640 ili slična

Ipak kako sredstva često nisu neograničena, uvijek postoji kompromis karakteristike i cijena. Pogledati ćemo koliko investirati u grafičku karticu, ako na raspolaganju imate određeni iznos.

ATI Radeon X1650 GT čija cijena se kreće oko 700-800 kn je namijenjena jeftinijim računalima. Nešto je brža od X1650 PRO i 7600 GT, a overclockirana je u rang 7600 GT and X1650 XT.

Nešto skuplja je 2600 XT i namijenjena je gornjem segmentu jeftinijih računala. Blizu je GeForce 8600GT po karakteristikama.

Sljedeća stepenica je Radeon X1950 PRO. Pandan joj je 7900 GS, koji je skuplji. Nema neke velike performace za DirectX 10 naspram 8600 GTS, ali joj je cijena dosta niža.

Gornju srednju klasu čini Radeon HD X2900 PRO koji je po cijeni dosta jeftiniji od GeForce 8800 GTS 320 MB, mada zaostaje po karakteristikama.

Gornju klasu započinje GeForce 8800 GTS (640-MB). Ima ugrađen DirectX 10 GPU sljedeće generacije, isto kao i najjača 8800GTX. Ako planirate igrati na rezoluciji 1600x1200 vrijedi novca. Između njih se ugradila ATI Radeon HD X2900 XT.

Pogledajmo kako su se poredale kartice po snazi, pa sami odlučite koliko vrijedi koja, na osnovu stvarnih cijena u datom trenutku. Razni proizvođači imaju razne cijene iako se radi o istom čipu. Izvedbe kartica su različite. Neke imaju pasivne hladnjake, a neke ventilatore.

GeForce	Radeon
8800 GTX, 8800 Ultra	
8800 GTS	HD 2900 PRO, HD 2900 XT
7950 GX2	X1950 XTX
	X1950 XT, X1900 XTX

7800 GTX 512, 7900 GTO, 7900 GTX	X1900 XT
7800 GTX, 7900 GT, 7950 GT	X1800 XT, X1900 AIW, X1900 GT, X1950 PRO
7800 GT, 7900 GS, Go 7950 GTX, 8600 GTS	X1800 XL, X1950 GT, Mobility X1800 XT
6800 Ultra, 7600 GT, 7800 GS, Go 7800 GTX, Go 7900 GTX, 8600 GT	X800 XT (& PE), X850 XT (& PE), X1650 XT, X1800 GTO, Mobility X1900, HD 2600 XT
6800 GT, 6800 GS (PCIe), Go 7800, Go 7900 GS, 8700M GT	X800 XL, X800 GTO2/GTO16, Mobility X800 XT, HD 2600 PRO, Mobility HD 2600 XT
6800 GS (AGP), Go 6800 Ultra, Go 7600 GT, 8600M GT	X800 GTO 256 MB, X800 PRO, X850 PRO, X1650 GT, Mobility HD 2600
6800, Go 6800, 7300 GT GDDR3, 7600 GS, Go 7700, 8600M GS	X800, X800 GTO 128 MB, X1600 XT, X1650 PRO, Mobility X1800
6600 GT, 6800LE, 6800 XT, 7300 GT DDR2, Go 7600 (128 bit), 8500 GT	9800 XT, X700 PRO, X800 GT, X800 SE, Mobility X800, X1300 XT, X1600 PRO, HD 2400 XT
FX 5900, FX 5900 Ultra, FX 5950 Ultra, 6600 (128 bit), Go 6800 (128 bit)	9700, 9700 PRO, 9800, 9800 PRO, X700, X1300 PRO, Mobility X1450, X1550, Mobility X1600, Mobility X1700, HD 2400 PRO, Mobility HD 2400 XT, Mobility X2500
FX 5800 Ultra, FX 5900 XT, Go 6600, Go 7600 (64 bit), Go 8600M GS	9500 PRO, 9600 XT, Mobility 9800, 9800 PRO (128 bit), X600 XT, Mobility X700, X1050 (128 bit), Mobility X1350, Mobility X1400, Mobility X2300, Mobility HD 2400
4 Ti 4600, 4 Ti 4800, FX 5700 Ultra, 6200	9600 PRO, Mobility 9700 (128-bit), 9800 LE, X600 PRO, Mobility X600, Mobility X1300, Xpress 1250, Mobility HD 2300
4 Ti4200, 4 Ti4400, 4 Ti4800 SE, FX 5600 Ultra, FX 5700, 6600 (64 bit), 7300 GS, 8400 GS	9500, 9550, 9600, Mobility 9600, X300, X1050 (64 bit)
3 Ti500, FX 5200 Ultra, FX 5600, FX 5700 LE, Go 5700, 6200 TC, 6600 LE, 7300 LE, 8400M GS	8500, 9100, 9000 PRO, 9600 LE, Mobility 9700 (64 bit), X300 SE, X1150
3, 3 Ti200, FX 5200 (128 bit), FX 5500, Go 5600, Go 6200, Go 6400, Go 7200, Go 7300, Go 7400 (64 bit)	9000, 9200, 9250, Mobility 9600 (64 bit), Mobility X300
FX 5200 (64 bit), 6100, 6150, Go 7200, Go 7400 (32 bit)	9200 SE, Xpress 200M, Xpress 1000, Xpress 1150
2 GTS, 4 MX 440, 2 Ultra, 2 Ti, 2 Ti 200	7500
256, 2 MX 200, 4 MX 420, 2 MX 400	SDR, LE, DDR, 7000, 7200
Nvidia TNT	ATI Rage 128

Uz tako jaku grafiku možda treba razmišljati i o najnovijoj generaciji procesora iz Intelu.

QUAD procesori

Intel nastavlja i dalje sa strelovitim poboljšanjima svojih procesora i nakon 18 mjeseci prelazi sa 65 nm na 45 nm Penryn procesore. Trenutno najjači će biti Extreme QX9650 na 4GHz sa četiri jezgra. Ustvari radi se o dva procesora sa dvije jezgre. Nikada Intelu nije išlo tako dobro. Nastavlja se daljnje smanjivanje potrošnje, a time i zagrijavanja, koje je bilo problem do pojave Core 2 Duo generacije. Od 1960 godine MOSFET tranzistori koji se koriste u procesorima su na bazi silicija i silicij dioksida. Sada s će se koristiti nova High-K Dielectric tehnologija. AMD za sada nema odgovor takvim procesorima, ali najavljuje skori izlazak na tržište.

Prvi testovi pokazuju zapanjujuće malu potrošnju (još 30% manju) i nude veliku rezervu za overclockiranje. Čak i overclocirani do same granice (5,9 GHz) ne pokazuju neko zabrinjavajuće zagrijavanje, već ono kakvo je kod današnje Core 2 Duo generacije. Cache memorija je 12 MB (2x6 MB), što

je opet veliki skok i ubrzanje od 27% u mnogim aplikacijama koje koriste sporiji RAM. Mnogi se pitaju ima li to zaista smisla, tim više što se 2009. godine planira prelazak na 32 nm.

External Graphics Upgrade for Notebooks

Upgrading your Laptop

Laptops are fantastic tools, but the portable design philosophy that makes the laptop possible is responsible for one of its most irritating flaws: an utter lack of upgradeability. Sure, you can upgrade the RAM in your laptop, but other than that, you're probably out of luck. Even if your CPU is fast enough to perform the newest tasks, your video chipset will often limit what you can do.

Want to use three or more displays? Sorry, most laptops only support the included display plus another using an analog out. Want to buy an external Blu-Ray player for your laptop? If your integrated video chipset doesn't support DHCP, or doesn't accelerate decoding, it's not going to play Blu-ray movies. What if you'd like to play some of the newer video games? Sorry, your laptop's integrated video is too slow, and you can't upgrade the video card...

Or can you?

While it's true that there are a small number of laptops out there with an upgradeable video chipset solution, such as MXM, Axiom, or Dell's proprietary slot, these are by far the minority. For most laptops, upgrading the internal video chipset is simply not an option. Yet with the introduction of the external ExpressCard interface, we have seen companies explore the realm of the external graphics card upgrade.

By now you have probably heard of XG Station from Asus, an ExpressCard solution currently in development, but not yet ready for purchase or even testing by our labs. The PC technology company MSI demonstrated the Luxium, but when we talked to them they told us it was nothing more than a technology demonstration at this time. A company called Magna has been selling the 'Expressbox', which, with no included videocard, looks to be an ExpressCard-to-PCIe adapter that leaves the graphics card purchase and installation up to the user. What you might also have heard of is another solution by a company called Village Tronic: the ViDock Gfx.

ViDock Gfx PRO: Features and Specifications

In Village Tronic's documentation, they claim that their goal with the ViDock is to "create an affordable, reliable device that would empower notebook users by allowing them to connect more and bigger displays to their [computers](#), as if they were desktop systems."

The ViDock is much more than this simple goal would suggest. While Village Tronic focuses on the ViDock's multiple display functionality, its hardware might be considered a little overkill for this task. While it does offer support for a lot of displays, the ViDock offers a great deal of [3D graphics acceleration](#) for laptops with slower integrated chipsets, allowing for much faster performance in professional 3D applications, games, and HD 1080p video playback. In addition, the ViDock includes a USB port in addition to its display outputs, which makes it a very attractive docking station for users on the go who want to use a better display, keyboard, and mouse when they get home: with the ViDock, all of that can be quickly attached with a single ExpressCard cable.

Since driving multiple displays is Village Tronic's core focus for the ViDock, let's look at that functionality first. Village Tronic claims that the ViDock supports the highest resolutions available to an external graphics card solution, with the ability to drive two analog or two digital displays at 2560x1600 each.

Here is a breakdown of some competing external display solutions and their specifications compared to the ViDock Gfx:

Two displays solution	Village Tronic ViDock Gfx	Belkin High Speed Docking Station	Village Tronic VTBook	DisplayLink USB Graphics (DL160)	Matrox DualHead2Go Analog/Digital
Host Interface	ExpressCard	ExpressCard	CardBus	USB 2.0	VGA/DVI
MSRP (USD)	329... 499	169	249	149	199/229
OS Compatibility	Win XP, Win Vista, Mac OS X	Win XP, Win Vista	Win 2000, Win XP, Mac OS 9, Mac OS X, Linux	Win XP, Win Vista, Mac OS X	Windows, Mac, Linux
Win Vista Aero Support	Yes	No	No	No	Yes
Display Connector	1x DVI-I DL + 1x VGA (Business) 2x DVI-I DL (Pro)	1x DVI-D or 1x VGA	1 DVI-I	1 DVI-I	2x VGA/2x DVI
Video Memory	128 MB (Business) 512 MB (Pro)	64 MB	32 MB	32 MB	No
Max Analog res	2x 2560x1600	1x 1600x1200	1x 2048x1280	1x 1600x1200	2x 2048x1280 (analog version)
Max Digital res	2x 2560x1600	1x 1600x1200	1x 1920x1200	1x 1600x1200	2x 1920x1200 (digital version)
HD Video acceleration	Yes	No	No	No	No
HDTV resolution	Yes	No	Partial	No	No
Multidisplay Utility	Yes	No	Yes	No	No
USB Docking Port	Yes (power always on)	Yes	No	No	No
3D Acceleration	Yes	No	No	No	Yes (through main graphics chip)

[+ Village Tronic's comparison of multiple display solutions](#)

As you can see from the chart, the ViDock does seem to offer the most feature-rich display solution available. I would note that Village Tronic's chart would suggest that all versions of the ViDock Gfx will accelerate HD Video playback, but as far as I know, the base model ViDock 'Business Edition' models—sporting Radeon X1550 or [GeForce 7200 GS](#) graphics—probably won't sufficiently accelerate high-definition 1080p video from a Blu-ray source in a satisfactory manner. Without this version of the ViDock to test, though, we can't say for sure.

Speaking of the different versions of the ViDock, let's consider the different models, the hardware each model sports, and the suggested retail prices:

ViDock Gfx Business Edition

MSRP: \$329

ATI Version: GPU X1550, 128MB DDR2

NVidia Version: GPU GF7200GS, 128MB DDR2

ViDock Gfx Pro Edition

MSRP: \$429

ATI Version: GPU HD2600Pro, 512MB DDR2

NVidia Version: GPU GF8600GT, 512MB DDR2

ViDock Gfx Mac Edition

MSRP: \$499

GPU: GPU X1550, 128MB DDR2

As you can see, the \$100 price spread between the Business and Pro versions of the ViDock will upgrade the user from a low-end 128MB DirectX 9 graphics chipset to a more respectable 512MB DirectX 10 graphics chipset. However, we should point out that the street price difference between, say, a X1550 and a 2600 PRO 512MB is only in the neighborhood of \$40. And it's also notable that the Mac version is considerably more expensive than the PC version of the ViDock.

Village Tronic anticipates the ViDock's retail availability by the end of the second quarter of 2008. This means that we were given an early pre-release version of the ViDock Gfx Pro for testing, so bear in mind that the company has some time to iron out any problems we might encounter.

Now that we know what to expect, let's dig in to the hardware!

ViDock Gfx PRO: First impressions and examination

Our ViDock sample came well packaged in an attractive box. The main [components](#) are the ViDock box itself, a power cable, some DVI-to-analog converters, as well as a DVI-to-HDMI converter. As it is a prerelease version, some of the materials were beta versions, such as the driver CD, but there was nothing really to complain about.



[Zoom](#)

The ViDock Gfx itself is a fairly simple looking unit, essentially a metal box with identifying decals and holes for air movement. While it isn't an offensive look, I personally found it a little uninspired and old-fashioned, in my humble opinion. The Asus XG station is quite flashy, and although I didn't expect the same from the ViDock, I think a Mac-inspired white box design would have been more attractive and appropriate. But I'll be the first to admit that styling is a purely subjective affair, and it's the functionality that counts.



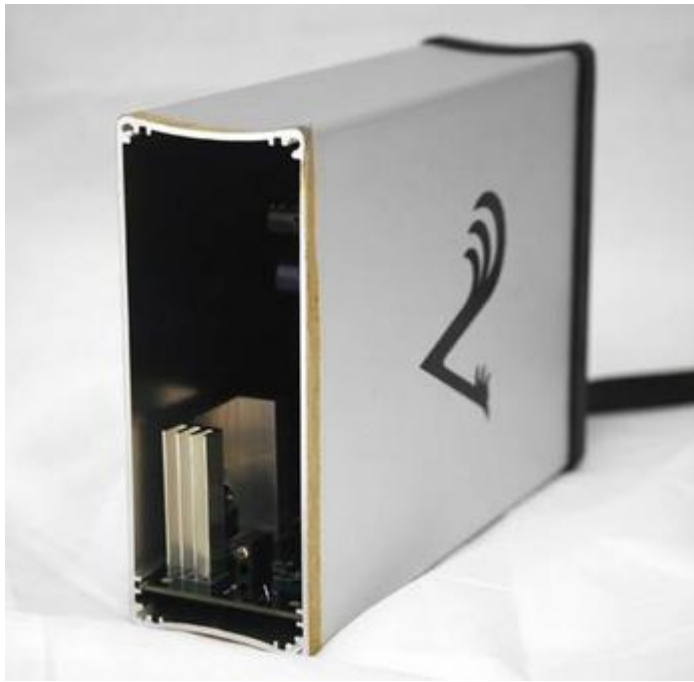
[Zoom](#)

The back of the unit is where all of the attached cables go. Two DVI display ports and the USB and [power supply](#) connections reside here, as well as the single ExpressCard cable that will attach to the laptop when in use.



[Zoom](#)

At Tom's Hardware we are always interested in the internals, so of course we probed deeper than a cursory inspection. The screws holding the ViDock together were covered by protective rubber which was glued on but came off fairly easily, allowing us to remove the front and back covers of the device:



 [Zoom](#)

With the covers off, the main circuit board and [graphics card](#) slid out easily, showing us the man behind the curtain: the Radeon 2600 PRO 512MB, in this case, an HIS branded card.

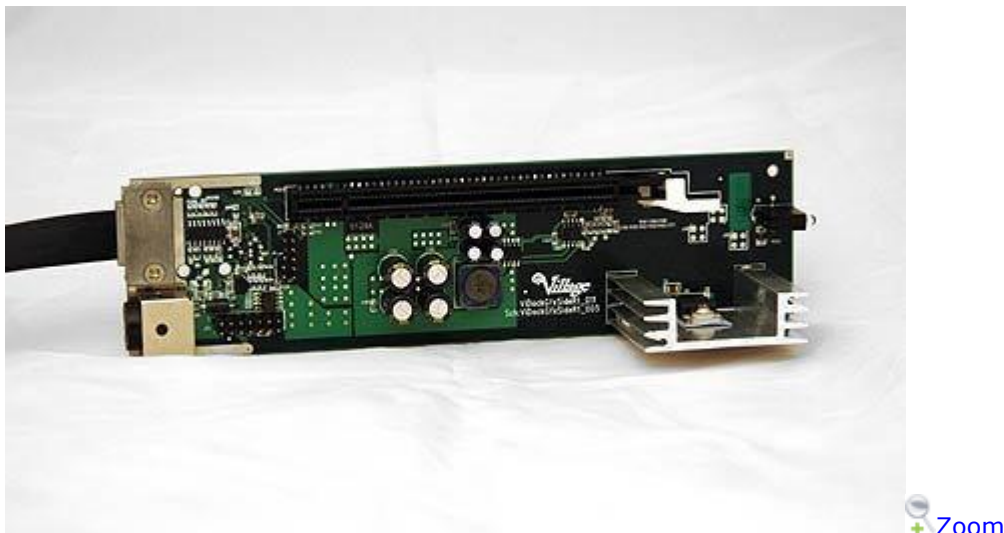


 [Zoom](#)



 [Zoom](#)

At its heart, the ViDock is an ExpressCard-to-PCIe adapter, as we can see when the card is removed.



Seeing the ViDock in its glorious simplicity certainly made us wonder how the ViDock would perform with a different [graphics](#) card. This is something we tested out later in the review, so read on!

Operating System Factors and Workarounds

Unfortunately, there are problems associated with using the ExpressCard interface to drive an external graphics card, and these problems are not transparent to the user. First, let's consider the operating system.

The WDDM graphics architecture used in Windows Vista will only allow one graphics driver to be running at a time. This forces the user to match the version of the ViDock they purchase to their existing integrated video chipset: that is to say, if your laptop has an integrated Radeon video chipset, you need to purchase the Radeon version of the ViDock. If your laptop has an integrated GeForce video chipset, you need the GeForce version of the ViDock. If your laptop has an integrated Intel video chipset, you're plain out of luck; no version of the ViDock will work specifically for these chipsets.

Village Tronic mentioned that while it is theoretically possible to force a Radeon or GeForce version of the ViDock to work on an Intel chipset by installing the XPDM driver model, this would disable features like the Windows Aero interface, DirectX 10 graphic fidelity, and hot-plugging. More importantly, Village Tronic won't guarantee it will work at this time, as XPDM driver support isn't what they'd like it to be.

On the plus side, Vista does allow for hot plugging, and system bus resource allocation will not be a problem in this OS. All monitors driven by both the ViDock and the internal graphics adapter will also allow the Aero interface to be enabled.

As an alternative, we'll consider Windows XP: unlike Vista, XP supports multiple graphics drivers, so the type of integrated video chipset used doesn't matter. While this situation is ideal, it turns out that some laptop manufacturers don't follow PCMCIA configuration/booting procedures as strictly as they could in their BIOS, and as a result some laptops simply won't recognize the ViDock. While Village Tronic claims to be working with manufacturers to update their BIOSes, it's probably a good idea to check their compatibility list before committing to purchase a ViDock for a Windows XP machine. For example, the Windows XP laptop in our lab was unable to work with the ViDock (see Installation and Issues, below).

Macintosh operating systems OS X Tiger and Leopard are also supported with the specific ViDock Gfx Mac Edition, which can handle all of the advanced 3D capabilities of OS X. The only drawback is that hot plugging is not yet supported.

Limitations, Installation, Usability

Limitations using the ExpressCard Interface

Beyond the operating system issues, we should mention the limitations of the ExpressCard interface itself.

First, let's consider traditional [graphics](#) bus interfaces. The older AGP 8x bus provides one-way bandwidth of 21 Gbits/s, and even by today's standards this is a good amount of bandwidth for a [graphics card](#). The newer PCI Express 16x standard for video cards can push 40 Gbits/s in both directions simultaneously, which is probably more than current [graphics](#) card technology really needs for a single video card.

Now let's look at the ExpressCard bus. It's based on a PCI Express 1x connection, with about 2.5 Gbits/s of bi-directional bandwidth available, which is a small fraction of what even the older 8x AGP standard can push! When it comes to graphics card technology, the ExpressCard bus is functionally very close to the ancient AGP 1.0 standard, about a quarter the one-way bandwidth of AGP 4x and an eighth of AGP 8x. Yikes!

This bandwidth limitation is most certainly going to limit the performance of an external graphics solution using the ExpressCard interface. The question is: how much will it limit performance, and how much better than the integrated graphics solution will it be? We'll find the answers to these questions when we benchmark the hardware later in the article. Now, though, let's talk about installation.

Installation and Usability

As we mentioned above, the ViDock is picky about the operating system it's run on. The laptop we had originally chosen for testing was a Gateway model with Windows XP and a Geforce Go 6100 integrated chipset. As Windows XP supports multiple video drivers at the same time, we planned to be able to use the ViDock Pro Radeon version, as the Geforce version was not available for us to test.

As we mentioned above, though, some manufacturers do not strictly support PCMCIA configuration/booting procedures in the BIOS. The Gateway laptop we had slated for testing simply would not work without a new BIOS that would address the problem. Since we couldn't find any appropriate BIOS available, we were out of luck.

In the interests of completing our review, Village Tronic supplied us with a [Dell laptop](#) for testing that used Windows Vista and had an integrated Radeon Xpress 1150 video chipset. Because we were using Vista, the version of the ViDock had to match the internal chipset of the laptop, so we were good to go with the ViDock Pro Radeon edition.

On this second laptop, installation was relatively quick and painless. We simply installed the driver, plugged the ViDock in, rebooted, and everything was good to go. When there's not much to report as far as an installation goes, that's a good sign.

Once we were up and running, things went relatively smoothly. To the developers' credit, we encountered no show-stoppers on the pre-release software and hardware, although we did run into a couple of glitches.

The first annoyance we found was linked to the ViDock's bundled VT Multidisplay application. The application is quite robust, and offers powerful control of multiple display configurations, window

management, display profiles, cloning, and a host of other features. However, we found the early release a little unreliable, in that there were times that it didn't seem to implement our screen configuration choices. We ended up setting the display configuration within the Catalyst Control Center, which offered us flawless control of all of the multiple displays, even those of the ViDock.

The second annoyance was an intermittent display flickering we had experienced on rare occasions. We couldn't find an obvious cause for the problem, but it was a little distracting, although when we launched a 3D application it seemed to disappear.

Aside from these two annoyances that we hope will be addressed before the ViDock is released, the unit worked like a champ. 3D applications were greatly accelerated compared to the integrated [graphic chipset](#), as the benchmarks below will demonstrate, and the power of the ViDock to drive the multitude of displays was impressive to say the least.



Now that we know the ViDock can handle multiple displays with relative ease, let's see what kind of 3D graphics prowess it brings to the table.

Test System and Configuration

Hardware

System Hardware	
Processor:	AMD Athlon X2 TK-53, 1.7 GHz, 800 FSB, 512KB Cache
Motherboard:	DELL 0WY383, BIOS: 2.5.2 (07/30/2006)
RAM:	Hyundai PC2-5300 @ 266 MHz
	2x512MB, Dual Channel, CAS 4-4-4-12
Hard Drive:	Samsung HD160JJ - P80SD
	160 GB, 7200 RPM, 8 MB Cache, SATA 300
Networking:	NVIDIA nForce onboard Gigabit Ethernet NIC
Graphics Cards:	Integrated Radeon Xpress 1150, 256MB RAM (shared)
	Sapphire Radeon 2600 XT, 256MB RAM
	HIS Radeon 3870, 512MB RAM

Software

System Software & Drivers

OS: Microsoft Windows Vista (6.0) Business Edition

DirectX Version: 10

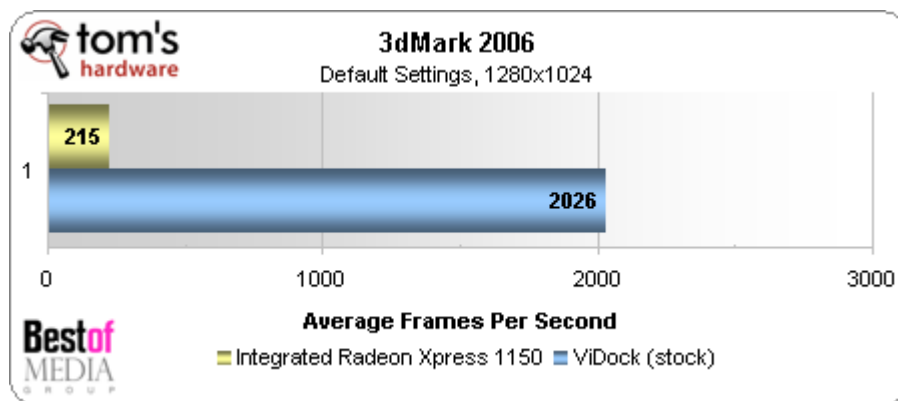
Graphics Driver: Catalyst 7.10

The Dell Laptop we tested the ViDock on has an Athlon X2 1.7 GHz processor. This isn't the most powerful laptop processor by a long shot, so it will provide a decent representation of what the ViDock Pro can do for a typical machine.

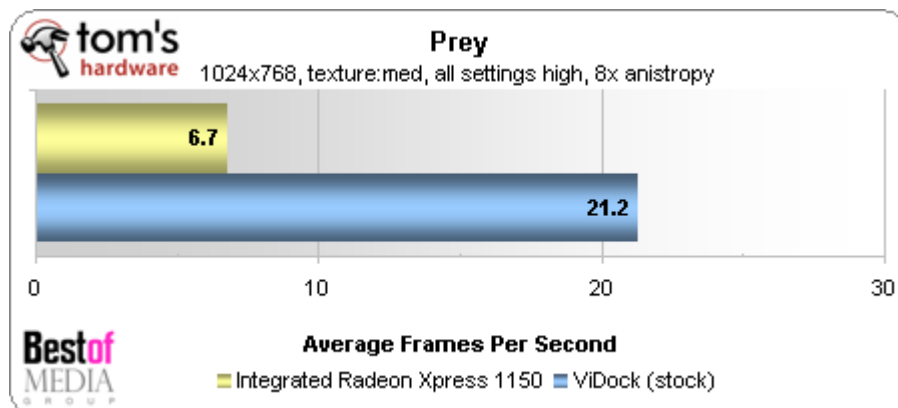
It's important to mention that the driver included in the ViDock installer was the older Catalyst 7.10 driver. Because of this, it's the driver we used in all of our testing, including the video cards we jury-rigged to work with the ViDock.

First, let's look at what the ViDock Pro accomplished compared to the integrated chipset in games and 3D production benchmarks.

Game Benchmarks

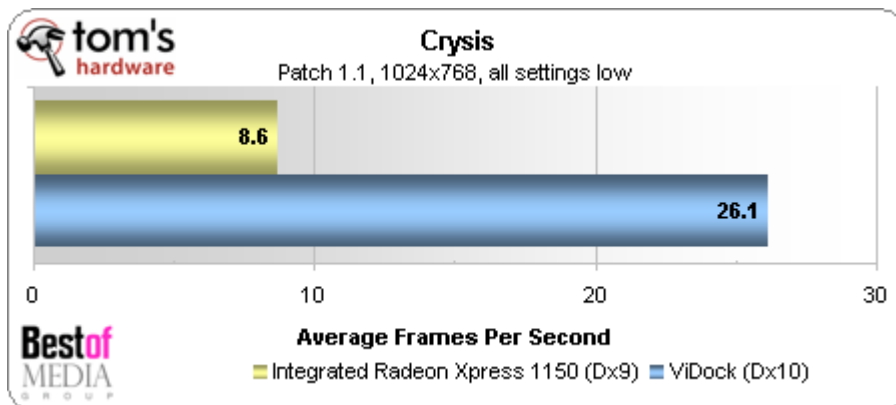


We'll start with the synthetic gaming test 3dMark 2006, where we immediately see a dramatic improvement in performance: the ViDock provides a tenfold increase in [3D gaming](#) speed according to this benchmark! At this stage, it doesn't look like the limitation of bandwidth from the ExpressCard bus is going to slow the ViDock down much. But 3dMark can be deceiving, so let's have a look at an actual game title, such as Prey.

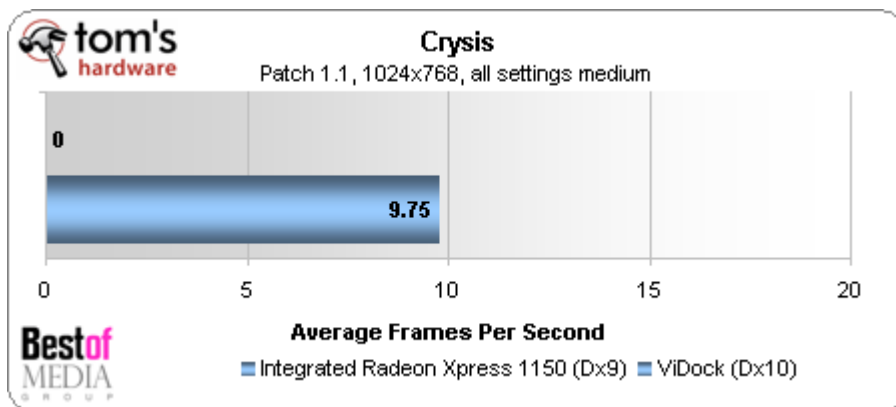


At 1024x768 with the texture detail set to medium and all other settings high, Prey becomes playable with the ViDock—managing an average frame rate of about 20 frames per second—but it’s certainly no speed demon. Even though there’s almost a 4x increase in performance over the integrated chipset, and the game is technically playable, it looks like maybe the ExpressCard bus is slowing things down quite a bit. But the verge of playable is better than not playable at all, so we’ll give the ViDock Pro credit where it’s due.

Now let’s move on to one of the most demanding games of all time: Crysis!

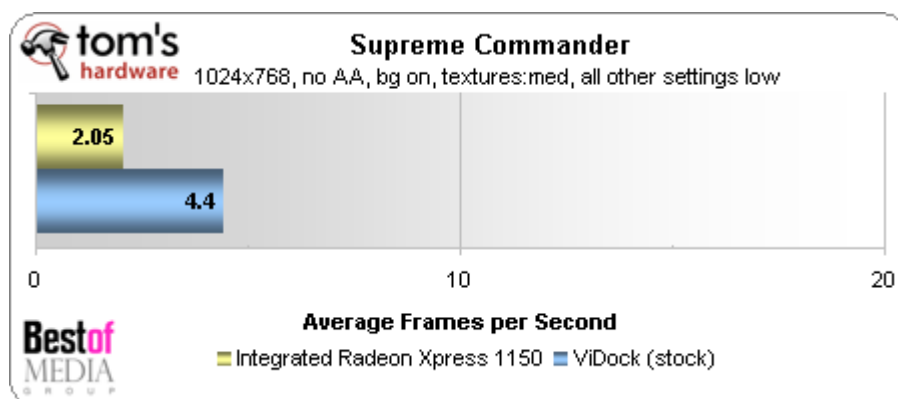


With all [settings set](#) to low detail at 1024x768, the ViDock Pro delivers a very playable 26 frames per second! This is a major victory for the ViDock, as the integrated chipset could barely achieve an unplayable 8 frames per second. But the Crysis visual goodness really begins at medium settings, so let’s see how the ViDock fares when we crank things up a notch...



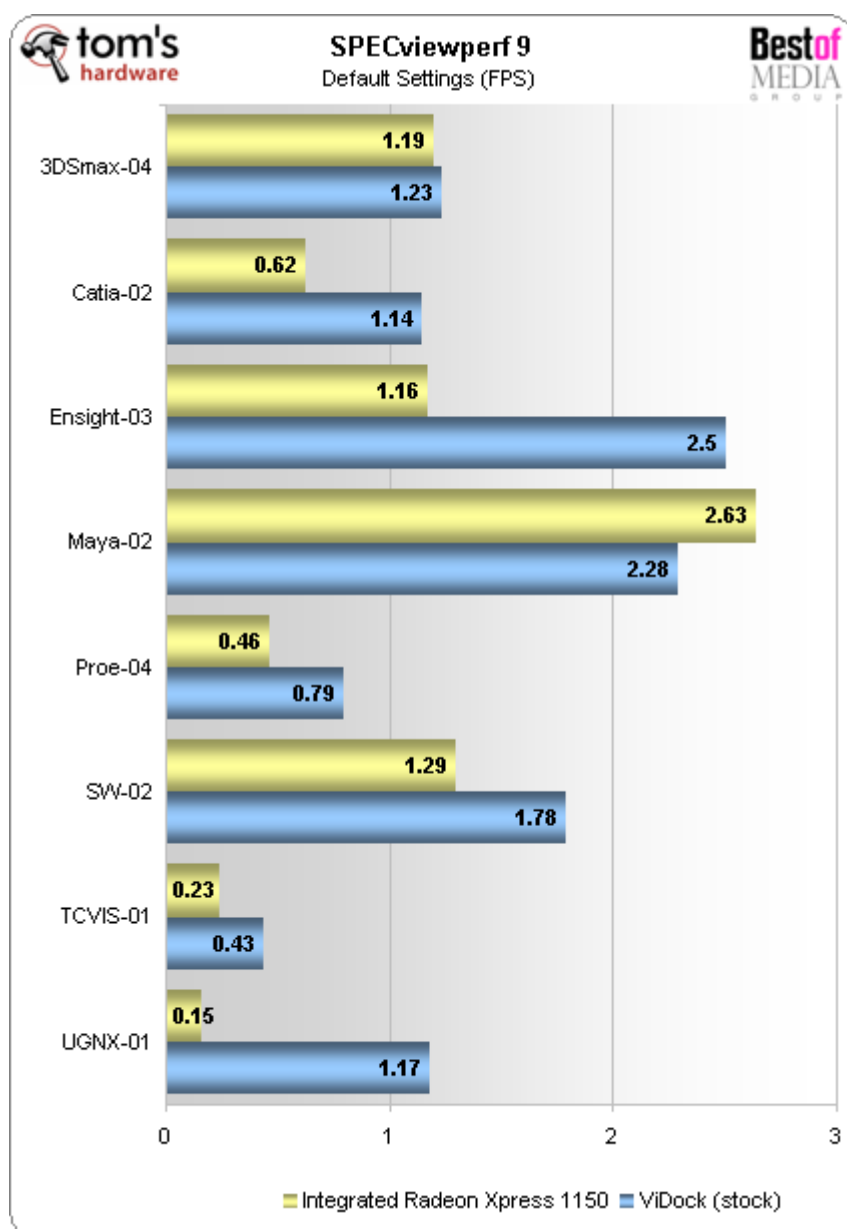
Uh-oh. At medium settings the integrated chipset won’t even run Crysis, and the ViDock can only muster an unplayable 10 frames per second.

At this point we can see that the ViDock will supply passable [first person shooter](#) performance at 1024x768 assuming the details are turned down enough, which is quite an accomplishment compared to the integrated chipset, which couldn’t play games at 1024x768 to save its life. Let’s mix things up with the demanding [real time](#) strategy title, Supreme Commander:

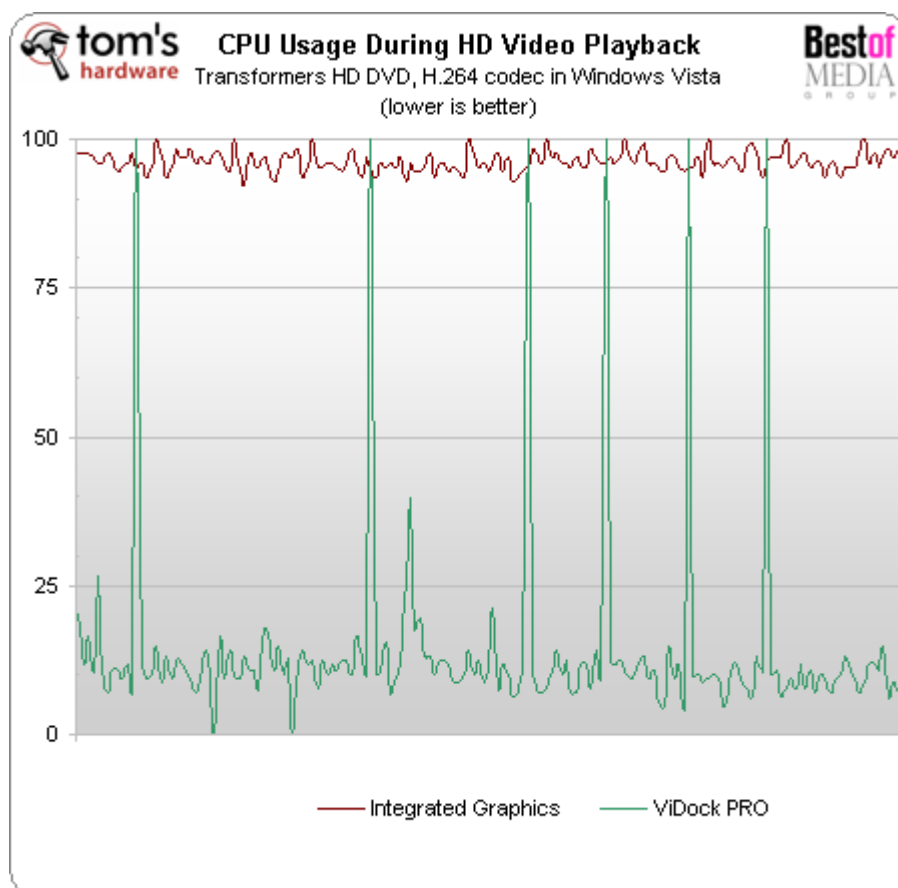


Ouch! While the ViDock managed to double the frame rate of the integrated graphics, it's somewhat of a pyrrhic victory: 4.4 frames per second is far from playable. While Supreme Commander is a CPU-dependent game, it should have been able to muster better frame rates than this with a dual-core Athlon, so we can't give the ViDock a lot of credit here.œ

3D Application and HD Video Playback Benchmarks



Specviewperf is a mixed bag, with the ViDock showing some impressive gains over the integrated chipset, on average, but a couple of rogue benchmarks are showing parity with the integrated chipset. It's quite possible that these particular benchmarks are favoring the integrated graphics' communication speed with the system over the ViDock's ExpressCard interface.



When it comes to HD [video playback](#) at the 1920x1080 resolution, the ViDock Pro is absolutely invaluable. Since the integrated Radeon Xpress 1150 has no HD acceleration, CPU utilization stayed close to 100%, yet [playback](#) still stuttered and was unwatchable! Contrast this with the ViDock, which allowed for HD acceleration on the GPU, removing the lion's share of the [decoding](#) and lowering CPU utilization to about 10%. More importantly, [playback](#) was as smooth as butter.

What we didn't notice during the smooth playback of the film is that CPU utilization was occasionally spiking to 100% and then, just as quickly, dropping back to about 10%. While this is a puzzling result, we didn't have time for more testing. As we said, it didn't seem to affect playback quality, but it's something we'll definitely be investigating in a future ViDock review.

It is very important to note that only the ViDock Pro will offer this kind of HD video acceleration; the cheaper ViDock Business edition is probably not able to accelerate HD video to this extent.

Regardless of the CPU utilization playback anomaly, the verdict is in: benchmarks show that the ViDock Pro offers a major increase in gaming performance over an integrated Radeon Xpress 1150, a major increase in performance for most professional 3D applications, and the ability to play back HD video, where the integrated solution falls flat on its face.

Modifying the ViDock for use with other graphics cards: the Radeon 2600 XT and 3870

Without faster graphics cards to test through the ViDock's ExpressCard interface, it's difficult to judge exactly how much of an impact the slower bus has on performance. To that end, let's see if we can do a few modifications and help the ViDock accommodate some faster video cards. (Of course, this sort of

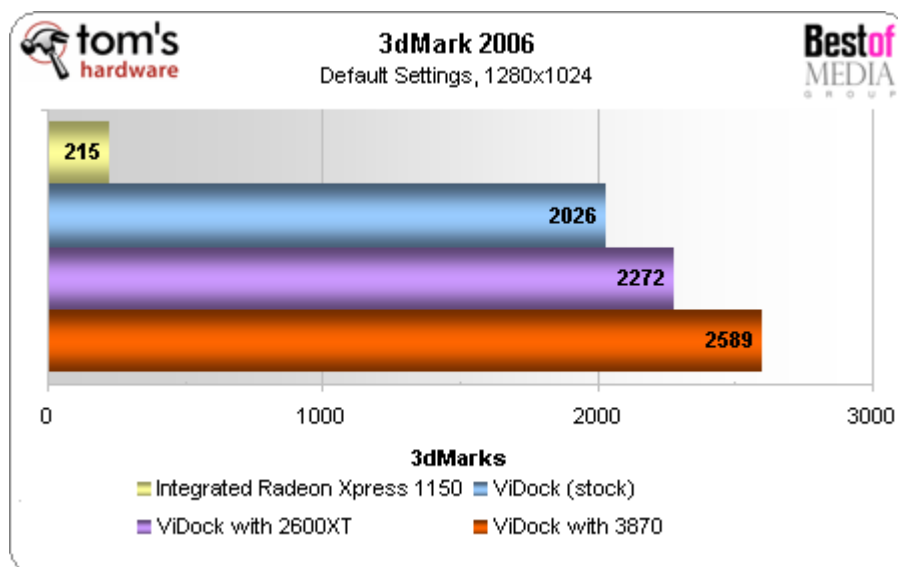
thing will almost certainly void your warranty, so it's not something we'd recommend by any stretch of the imagination.)

With the ViDock open, it's easy to imagine taking out the stock Radeon 2600 PRO and substituting a more powerful video card. The cards we chose to put in the ViDock would have to be Radeons to work with the driver, so we chose a Sapphire 2600 XT and an HIS 3870 to work with.

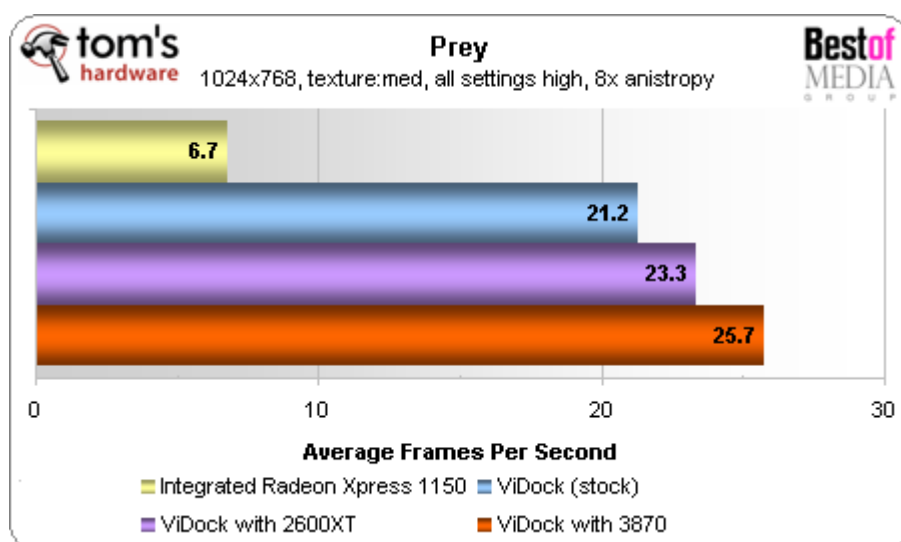
The 2600 XT was quite easy to integrate into the ViDock chassis. The large silent heat sink was a bit too large to fit in the enclosure, but we simply ran it with the enclosure off of the unit. Since the 2600XT doesn't require a separate power connector, it was that simple.

The Radeon 3870 was another kettle of fish entirely, though. The large card interfered with some of the parts on the ViDock chassis that had to be temporarily removed. In addition, the 3870 requires its own dedicated power cable; to get the card to work, we had to hotwire a separate power supply to provide the 3870 with the juice it needed to run. This was not a very practical solution for real use, but we figured it would get us through the benchmarks.

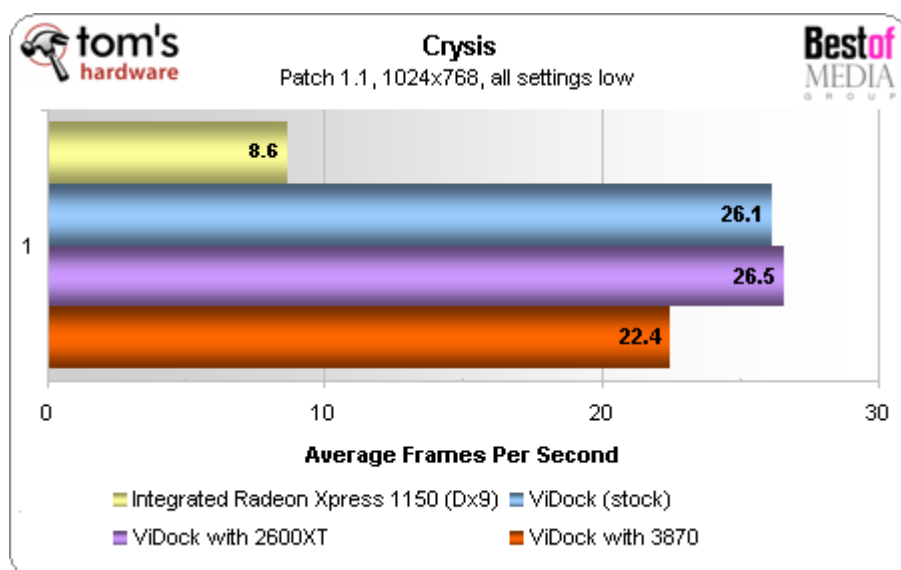
After we got things going, we recorded the following data.



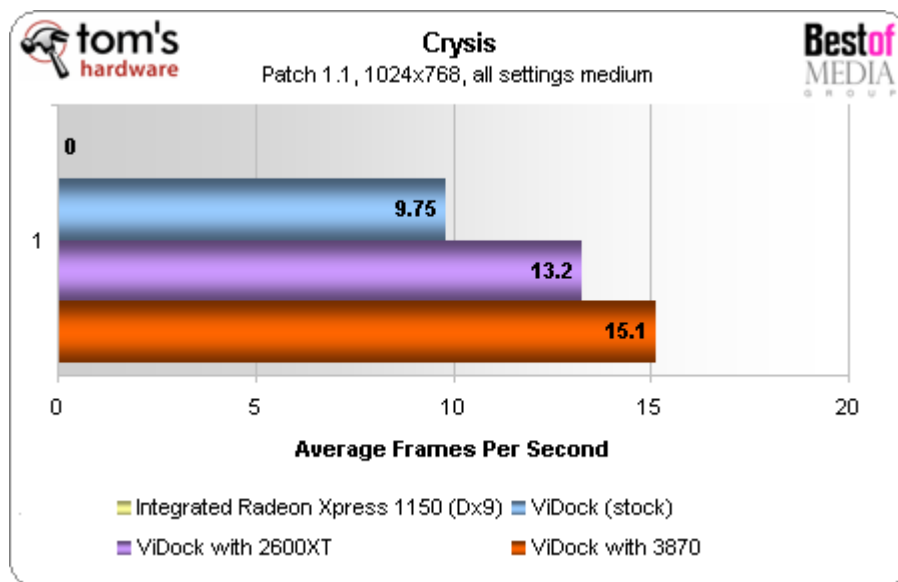
3dMark shows us the ExpressCard bandwidth bottleneck as clear as day. The Radeon 3870 should be getting scores many times that of the 2600 PRO in the stock ViDock, but instead we saw only a subtle increase in performance. The 2600 PRO is looking like a good match for the slow ExpressCard bus.



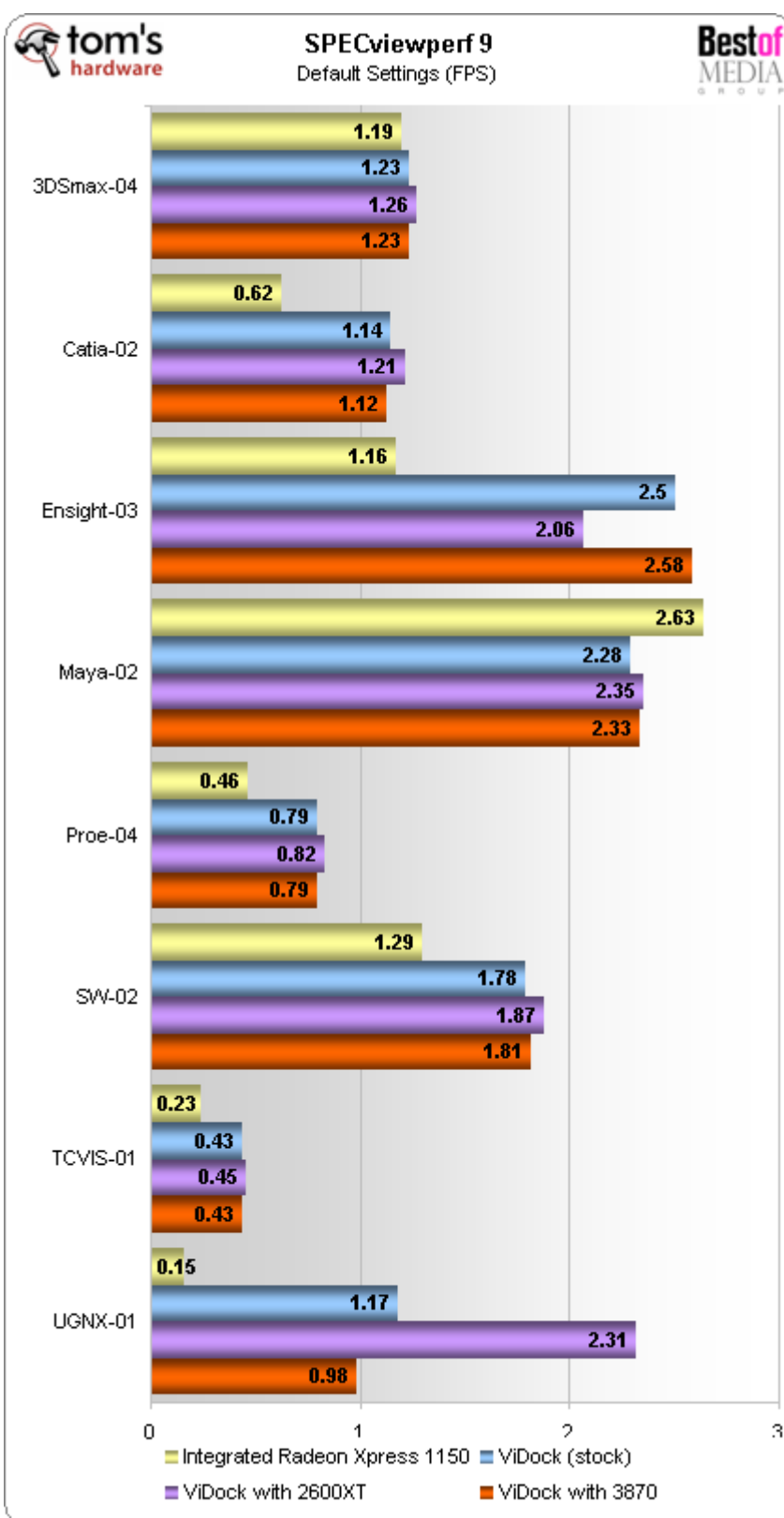
Prey shows us a close representation of what 3dMark just displayed: the ExpressCard bus is limiting the faster video cards so that they perform very close to the 2600 PRO that comes with the ViDock Pro.



At low settings, Crysis shows us a curious drop in performance for the Radeon 3870 compared to its slower 2600 brethren. This puzzling scenario defies explanation.



At the shader intensive medium settings, the 3870 takes its rightful place at the head of the pack. But it's important to note that the 3870 can't even muster enough power to play Crysis at medium settings at 1024x768, again because of the ExpressCard bus's relatively low bandwidth.



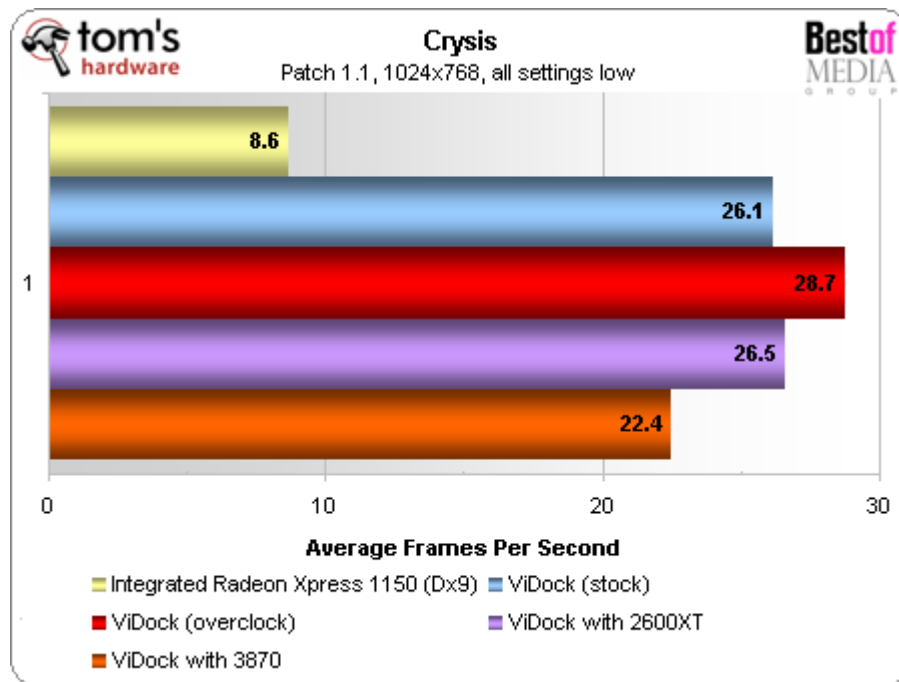
Professional 3D applications show us more of the same story: the ExpressCard bus severely limits the performance of the Radeon 2600 XT and 3870. It's no wonder that ViDock offers the Radeon 2600 PRO in the fastest ViDock model, as anything more is a waste of money and would just require more power to run.

Overclocking

The ViDock's Radeon 2600 PRO comes clocked at 600 MHz for the core and 500 MHz for the memory. We were wondering if the ViDock allowed for overclocking, and if so, how much performance would be gained from the endeavor, keeping in mind the limitations of the ExpressCard bus.

To that end, we fired up the overdrive option in the Catalyst Control center and forged ahead. To our delight, everything worked as it should; the 2600 PRO in the ViDock was happy to give us a significant overclock. The core went from 600 to 750 MHz, and while the memory wasn't quite as accommodating, it did jump from 500 to 550 MHz.

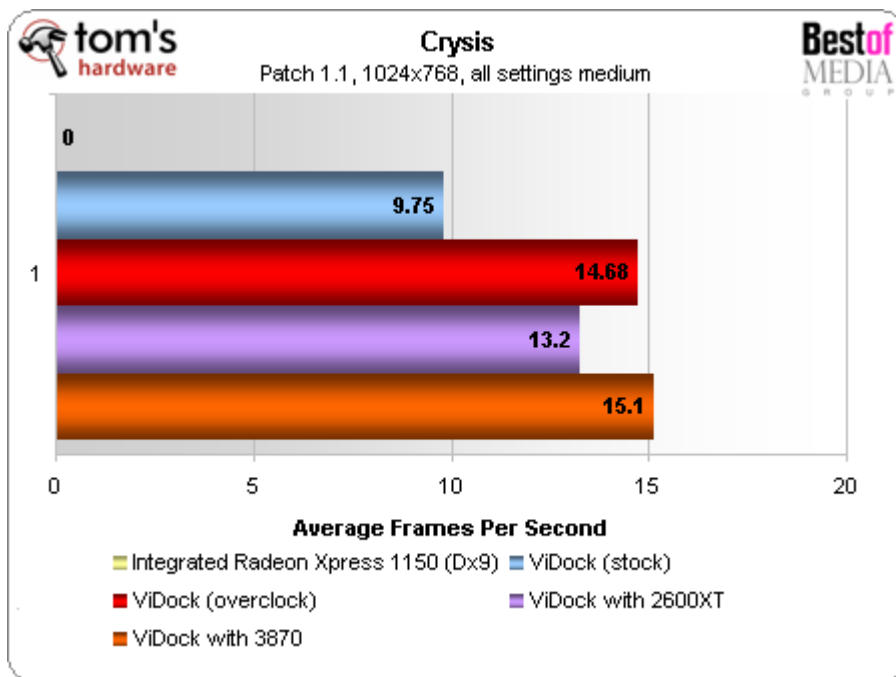
With the overclock in play, let's see what happened:



The results are puzzling to say the least: the overclocked 2600 PRO managed to best both the 2600 XT and the 3870. While the 3870 was clearly somehow stunted in this benchmark, what doesn't make sense at all is how the 750 MHz core / 550 MHz memory on the overclocked 2600 PRO beat out the 800 MHz core / 700 MHz memory on the stock 2600 XT. The chipset on the two cards should be identical.

While the slow PCIe 1x bus speed will definitely bottleneck the 2600 XT and 3870, it really doesn't make much sense that the overclocked 2600 PRO would overtake them both, even by a small margin. We re-ran the benchmarks a number of times and reproduced the same puzzling results.

Let's see what happens when the detail level is increased.



At the shader-intensive medium settings, we see the 3870 has retaken the lead, but it is very closely followed by the overclocked 2600 PRO, which continues to outperform the 2600 XT!

We contacted Village Tronic to see if they had any explanation for this puzzling result; perhaps the ViDock drivers or hardware was in some way specially tied to the 2600 PRO it came with. They didn't have any obvious answers for us, however.

Since we noticed this behavior at the end of our time with the ViDock, we didn't have a chance to test overclocking with further benchmarks. But we will make sure that when The Asus XG Station is released and we compare ExpressCard video solutions, we will put more effort into investigating this issue.

Conclusion

At the end of the day, is the ViDock an attractive solution for the owners of older laptops who want multiple display options, and perhaps a little more graphics power out of their laptops?

As far as multiple displays are concerned, the ViDock is an impressive solution. While the ViDock Business edition is a little pricey at the proposed \$329 price point, it does offer some interesting features over competing multiple display solutions. Of course, some of those solutions are a lot cheaper, so unless the higher available resolution and digital outputs of the ViDock are a must-have for your specific application, the ViDock Gfx isn't necessarily the best multi-display solution for everyone.

If you're considering buying the ViDock for increased graphics [performance](#), you've seen the numbers: the ViDock offers a huge leap in power over integrated video chipsets like the Radeon Xpress 1150, and even allows for HD [video playback](#). Having said that, the ViDock Pro edition is bottlenecked by PCIe 1x bandwidth to Radeon 2600 PRO performance, even if the [video card](#) inside is swapped for a more powerful unit.

While in many cases the 2600 PRO offers huge performance leaps over integrated graphics, we have to consider the ViDock Pro's MSRP of \$429: that's pretty close to the price of a new basic laptop. We were able to find a new laptop with an integrated GeForce 8600M / Radeon 2600 class chipset for under \$900, which probably even outperforms the ViDock Pro: remember that an integrated solution wouldn't be subject to the PCIe 1x bandwidth limitation the ViDock suffers from. To be fair, we also found a number of laptops over \$1000 with underpowered integrated video chipsets as well. The lesson is that if you're buying a laptop for graphics performance, you're much better off simply getting a more powerful mobile graphics chipset.

Where the ViDock shines and becomes very attractive is for the user who already has a laptop but wants all of these features—multiple display functionality, increased graphics performance, HD video playback, and the convenience of a docking station—all in a single package.

Unfortunately, interested buyers must already have a laptop with an integrated GeForce or Radeon chipset, and perhaps even a specific [operating system](#), so the ViDock's market is somewhat limited out of the gate. But if you fit the profile, the ViDock Pro may be well worth the \$429 price tag.