Moving to Dual Monitors

Guidelines for Implementation

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Introduction

Dual (or multiple) monitors have been proven to increase productivity in accounting firms across North America by 10% to 20%. It is also a simple and relatively inexpensive procedure that can be accomplished in a couple of hours either by yourself or with some technical aid. Given that the total costs for basic two 19" monitors with rack range from $625 to $1000 (depending on your present equipment and installation manner) the ROI can be measured in weeks and you'll wonder why you hadn't gone this route sooner.

Microsoft realized more than 10 years ago that working with two or more monitors would be a very desirable computing environment and when they released Windows 98, they built in support for multiple monitors. That support continued with 98SE, 2000 and ME, XP and Vista. There is support for up to 10 monitors built into the (If you use Windows NT, you're not out of luck, but this article won't help you as it is a more complicated solution. Your best alternative would be to contact a technical person experienced with NT and to use a specific dual-headed cards, like the Matrox G450, designed to work with NT.)

This paper outlines the choices in cards, monitors and stands with ballpark costs as well as a detailed implementation guide

Desk Top Computers - Video Cards

The key to having two or more monitors is not just having the monitors but have the video cards that drive them. Each monitor requires its own video driver and most computers come with only one video card and driver. Check your machine for the number of monitor connections you have. If you have 2, it is your lucky day. Skip this section and move right to the monitors. If you only have one, the first 1 is to replace your video card. (While it is possible to simply add another separate card into your PC, it is not recommended, as there can be problems with interference between the two monitors, and if you are using Windows Vista, the cards must be from the same manufacturer, if not the same card.)

There are two types of video cards:

A) cards with two or more fixed output slots

B) cards with one output and multiple attachments

Both types of cards work well. Pricing for the cards is a function of the number of monitors being attached as well as the resolution and memory desired. They can start as low as $100 for a basic dual monitor card with average resolution. That can climb to over $2000 for high-end, high resolution systems with 4 monitors. Look to spend about $150 for a good quality dual card from ATI and about $450 if you are looking to move to 3 or 4 monitors. Our recommendation is to begin with dual monitors and if you'd like more, upgrade again and use the cards in another machine.

Dual Monitors with Notebooks

Using two monitors is a lot easier than you might expect. It's actually easier with a notebook than with a desktop system. Since most notebooks already have two video adapters—one for the built-in LCD and one for an external monitor—you don't even have to add a card.

Your general procedure is probably to plug the external monitor into the notebook's output connector or docking station, then use the laptop's built-in feature for cycling between showing images on the LCD or the external monitor or both. Taking advantage of both monitors at once takes no more work. Plug in the external monitor, right-click anywhere on your Desktop, and choose Properties to open the Display Properties dialog box. Then choose the Settings tab. Follow the details in the Implementation Guide below.

If you would like to run multiple monitors from a notebook (2 to 4), check out a product called SideCar. The SideCar is a portable notebook computer accessory that enables you to drive up to four extra displays from a Windows XP/2000/Vista notebook — or up to two extra displays from an Apple PowerBook. The SideCar attaches to the notebook via a simple PC Card (PCMCIA) interface, enabling easy docking and undocking of the notebook from the multi-monitor display setup. Combined with a notebook's built-in LCD display and external monitor support, the SideCar enables up to six displays to be driven by a single Windows laptop. Each SideCar display is an independent monitor under Windows and Mac OS. You can run different applications on each display, move your mouse seamlessly across all displays, and even stretch applications across displays. The cost for the SideCar unit is $1299, excluding monitors.

Monitors

The basic assumption in all of this is that you are using modern flat-screen LCD's (or other technologies) rather than the old, huge, desk-top stealing monitors. If do not have LCD monitors, buy them, not only will they improve and increase your workspace, help with eye-strain due to much higher refresh rates (no flickering), it will modernize your image as well.

Size matters. The more screen area you have, the more you can put on it. The less scrolling you have to do for documents, the more time you save. The other key attributes to look for in monitors are the maximum resolution allowed and the response time (faster response time is better but we are still talking milliseconds here.)

Ball Park costs for monitors are as follows:

17" - $175 - $250

19" - $175 - $300 (Why go for a 17" monitor when 19's are similarly priced?)

20"+ - $400 - $800.

Horizontal Or Vertical?

Many monitors can be swiveled to give a vertical orientation rather than the more common horizontal. The benefits are the ability to see full 8-1/2 x 11 pages on screen without scroll, and working with longer rather than wider spreadsheets, but it really is a personal preference. LCD's can be mounted on racks either way, but you have to decide which orientation in order to get the correct rack.

There are lots of very good monitors out there that are not expensive. And if the store offers you an extended warranty on a monitor, do not pay, unless you have a tendency to knock your monitor off you desk. They are very reliable.

And for sheer esthetics, have your two monitors the same size, make and design.

Monitor Stands

While it is not absolutely necessary to use a dual monitor stand, it is recommended as it frees up a little desk space, keeps the two monitors tightly together and at a good height and normally keeps the cabling together and hidden away.

Most racks are capable of handling various sized monitors from 17” to 22” with an expandable back mount. Larger monitors will require a larger base and support and check whether the rack will handle both vertical and horizontal orientations.

There are a number of companies and designs that are available, with most priced in the $250 range. LCD monitors are ‘rack-ready’ meaning they already have the necessary mounting holes in the back at standard measurements.

Summary

The average hardware cost summary to add dual monitors to your workspace is, given that you already have one 19" LCD screen:

Desktop

Dual Video Card	-	$ 150
19" LCD Screen	-	$ 225
Monitor Rack	-	$ 250
Total	**-**	**$ 625**

Installation to have someone come to your offices to do the implementation should run about $ 150-300.

Notebook

19" LCD Screen	-	$ 225 Total

For as little as $225 for a notebook add-on or under $1000 for a desktop, you will see a 10% to 20% improvement in your productivity, saving time so that you can do other things, build your business, spend more time consulting with clients, spend more time out of the office at home with family or out with friends.

The ROI is a matter of weeks. The ROL (Return on Life) is immeasurable.

If you would like further information on this topic or if you'd like to have assistance in moving to dual monitors, please contact us at 2020 Canada , 905-891-8546 or e-mail us at richard.latimer@2020canada.ca .

Implementation and Installation Guide

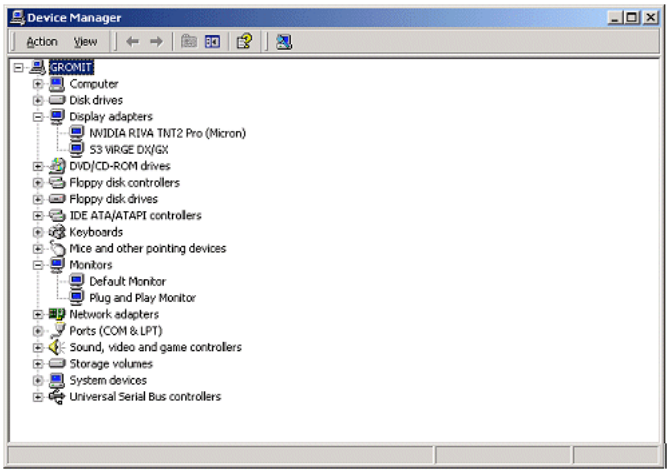
Getting dual monitors to work correctly is generally a straight-forward implementation. In most cases, it's just a matter adding a second video card and monitor and rebooting the computer. In other cases, you may need to do some cyber gymnastics to get things working correctly. The primary issue is the cards and the drivers. If those are set up correctly, then everything else follows smoothly.

The process is the same no matter which version of Windows you are using. First, be sure that your system is working correctly. Boot into safe mode and verify that you have only one video adapter and monitor showing in the Device Manager. If there are more, but you only have one adapter and monitor, you'll need to remove the extras.

Once you're sure that your video setup is working fine, turn off the system and look inside. Remember that you'll need a video card for each monitor that you plan to run under Windows. That means that your system must have a free expansion slot for each one. You may find that you have problems with IRQ sharing or DMA channels, depending on your motherboard and video card, although many video cards seem relatively intolerant of IRQ and DMA conflicts. Install your video card in the appropriate slot, and then connect the monitor.

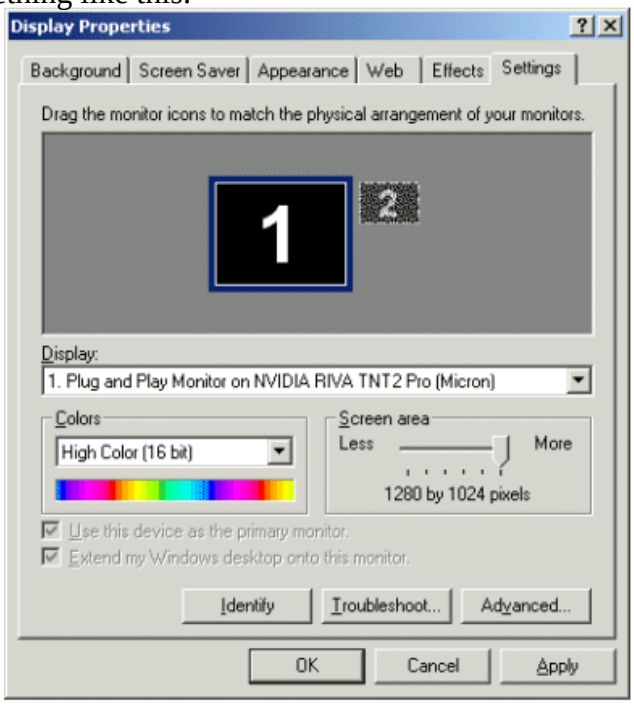
Restart your system. If all goes well, your computer will boot the same way that it always has…the second monitor will still be dark. If your system prompts you to login, do it. You may need to install drivers for your second video card, depending upon whether or not Windows has built in drivers or not. Just follow the on-screen instructions.

Once the drivers are installed, check the Device Manager to make sure that the display adapter is properly detected:

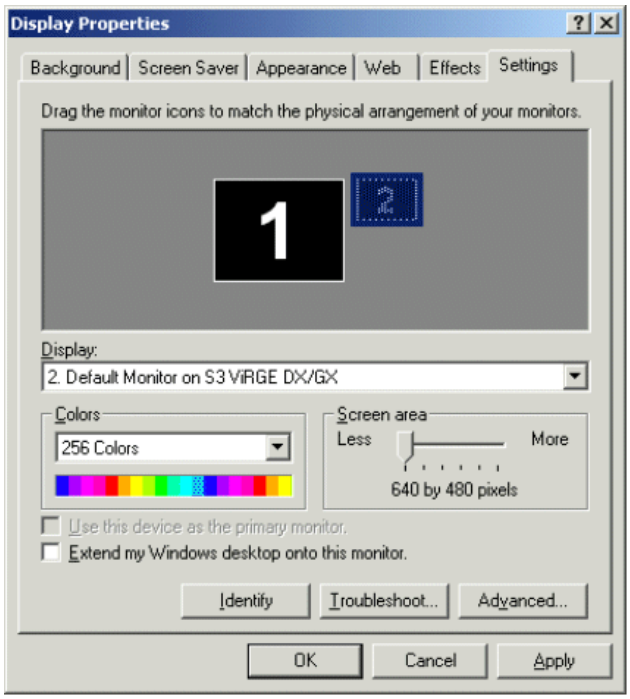


Implementation and Installation (cont'd)

Once the drivers are installed, open the Display Properties window. In the settings screen, you should see something like this:

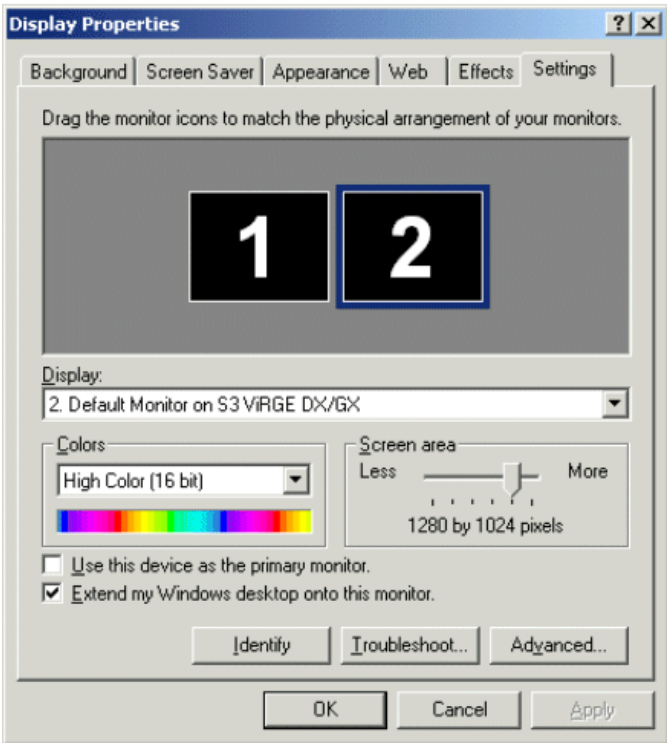


You'll see that a second display is shown. Click on the grayed out display marked as "2". The window will change slightly to look like this:



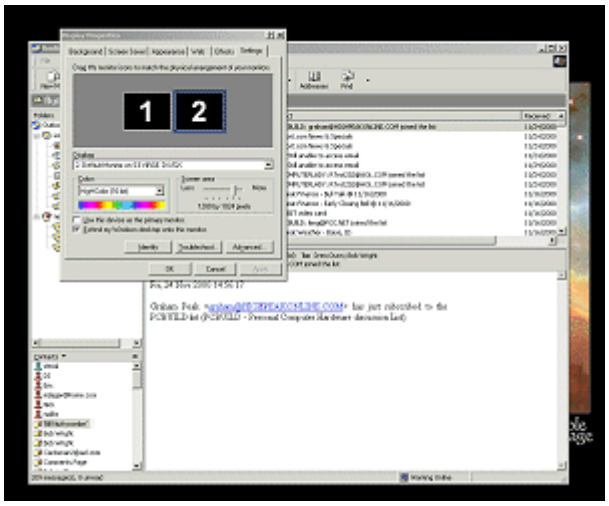
Implementation and Installation (cont'd)

You can then change the desktop resolution and color depth. Once you've done that, click your mouse on the "Extend my Windows desktop onto this monitor" to enable it. Remember that the resolution, color depth and refresh rates of each monitor adapter combination don't have to be the same. The window should look something like this now:



Click on OK and your second monitor should activate itself as an extension of the first:

You'll find that you can change the relative geometries of the two monitors by moving their respective boxes around in the Settings window.



Implementation and Installation (cont'd)

What if things don't work?

If you can't get your second monitor to work at all, call a technician in to troubleshoot. Computers can be frustrating and not worth the hassle of working through the issues unless you have experience.

If you still want to tackle it, there are a couple of steps that you can take. In some systems, you need to change a BIOS system to allow the PCI display adapter to initialize first, instead of the AGP adapter. You should be sure that both of your display adapters are supported by the version of Windows that you are using. Also, be sure that the display parameters (resolution, color depth, etc.) are within your monitor's limits. Windows allows you to select different display parameters for each monitor, so even though one might have lower performance than another, you'll still be able to use it.

The problem may be your computer itself. If you are using an older model with Windows 2000 (and more current versions), driver support for older PCI cards may be a little iffy. Many popular cards do have drivers, but just about as many don't. Also, remember that your computer has only one AGP slot, so you can only use one AGP card. The rest have to be PCI or ISA. Upgrade you computer, you will benefit from the increased processing speed.

And speaking of ISA video cards, I'd really recommend against using one. You'll find that your video resolution and color depth are very minimal and you may create more problems with IRQ sharing than you want to get into. Also, of course, many newer motherboards don't have ISA slots.

If you have a motherboard with one of Intel's i815 chipsets, you may have onboard AGP video. While it might be tempting to use the built in video and get a separate PCI card for the second display, please let me talk you out of it. Almost any AGP card that you buy, even the cheapest one, will outperform the video from these chipsets. If the onboard video is your main video source, put your money into a new video card before you consider adding a second monitor.

Dual monitor setups are a great way to expand your desktop without buying a monstrously expensive large monitor and, in most cases, it's very easy to do. A little preparation before you do the job should result in a whole lot of fun at the end.