

Inside Microsoft Windows® 98

Tips and techniques for Windows 98 enthusiasts

Windows 98's USB has 'Universal' advantages

What's
NEW!

As you may know, Windows 98 is the first PC operating system to provide full support for a new technology called the Universal Serial Bus (USB) communications channel. USB is superior to all of the traditional communications channels, such as the parallel and serial channels, in many ways.

In this article, we'll take a look at the advantages of the new USB communications channel. As we do, we'll explain how it works.

What's USB?

The USB communications channel represents a new connection standard champi-

oned by Microsoft, Intel, Compaq, and other prominent industry players. Basically, USB ports, as shown in **Figure A**, will eventually replace all of the port connectors now found on the back of your computer. You'll be able to connect keyboards, mice, joysticks, scanners, printers, monitors, digital cameras, telephones, modems, and an assortment of other devices to your computer via the USB port. In fact, USB will allow you to daisy chain up to 127 devices from a single port.

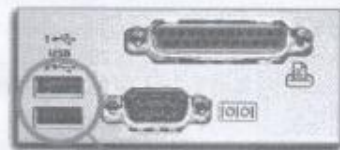
The power of USB

The USB channel pumps a lot more through the cable than just data; it also supplies a 5-volt power line to the peripherals connected to it.

So, USB will do away with the many cables used to connect peripheral devices to the system and eliminate the multitude of power cables dangling from the back of your desk to the power supply.

The speed of USB

When compared to parallel and serial ports, USB ports provide incredibly fast communication channels between your PC and the peripheral devices. In fact, USB



USB Ports

Figure A: USB ports will eventually replace the traditional communications ports on the back of your system.

Does your system have USB ports?

Beginning in 1996, a few computer manufacturers started to include USB ports on their new systems. Since the release of Intel's 440LX chipset in 1997, USB has become more widespread. So, if you've purchased your system in the last three years, you probably have one or two USB ports, which are small, flat jacks, about 7mm by 1mm, on the back of your system's chassis. They're usually labeled.

If you'd rather not mess with your system in order to find out if it's USB-ready, you can download the USB evaluation utility from the USB Web site at www.usb.org/usbready.exe. This handy utility will immediately tell you if your computer's USB-ready.

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has two data transmission speeds: 1.5Mb per second (Mbps) for lower-end devices (such as keyboards, mice, and joysticks) and 12Mbps for higher-end devices (such as scanners, printers, monitors, and modems). To help you put this into perspective, 12Mbps is comparable to the transmission speed of a 10BaseT Ethernet network. A further advantage of having two data-transmission speeds is that lower-end devices only use the bandwidth that they need and won't hog bandwidth that the higher-end devices need.

Plug-and-Play support

The best feature of a USB communications channel is that it's hot swappable. In other words, USB works very much like the current Plug-and-Play system, but on the outside of your computer, allowing you to add and remove devices without powering down or reconfiguring the computer. When a new device is added or removed, Windows 98 automatically detects the change and then loads or unloads the appropriate driver.

The daisy chain

When we mention that you can daisy chain up to 127 devices on a USB port, you may imagine a single cable with multiple plugs on it. However, USB is different, as each USB device can act as a hub, or more specifically a distribution point. For example, you could have a USB key-

board plugged into the USB port on the back of your system. The keyboard would then have its own USB port into which you can plug a USB mouse. As another example, you could have a USB monitor with USB ports for speakers and a microphone.

Unfortunately, very few USB devices have the extra port to support this type of daisy chain arrangement. So for the time being, if you have more USB peripherals than ports, you'll need to use a USB hub or add more USB ports to your system. For

Adding USB ports to your system

If you happen to have a system that doesn't have built-in USB ports, and you want to experiment with USB devices, you can easily add a USB port to your system via a PCI card. For example, Belkin, a manufacturer of all sorts of add-on devices, now makes such a card.

Called the USB BusPort, this card simply slips into any available PCI slot and instantly provides you with two USB port connectors. The USB BusPort carries a suggested retail price of \$49.95. For more information about the USB BusPort, point your browser to Belkin's Web site at usb.belkin.com/html/products.html.

Extending your USB connection with a hub

If your system is equipped with USB, chances are that it only came with two ports. We mentioned in the main article that very few USB devices contain their own USB connectors for daisy chaining devices. This means that if you have more than two USB devices, you'll have to unplug one USB device before you can plug in another device. While USB's Plug-and-Play support will make this easy on your system, reaching behind your machine every time you need to switch will be a hassle. You'd be better off purchasing a USB hub.

A USB hub will add four or more ports to your system and allow you to plug in more devices. Furthermore, since the hub will sit on your desktop or on your system's box, plugging and unplugging devices will be much easier.


Since many higher-end USB devices will hog power, which can cause other devices to fail, make sure that you get a self-powered USB hub. This will ensure that all of your devices work correctly.

Belkin makes a couple of nice, self-powered USB hubs. The ExpressBus 4-Port hub carries a suggested retail price of \$79.99, while the ExpressBus 7-Port hub carries a suggested retail price of \$109.99. For more information about the ExpressBus, point your browser to Belkin's Web site at usb.belkin.com/html/products.html.

more information, see the sidebars "Extending your USB connection with a hub," and "Adding USB ports to your system."

USB is the future

While USB is a much better technology than anything we now have, it's impor-

tant to keep things in perspective. There are literally thousands of parallel, serial, and other devices out there that will be around for quite some time. So it may be several years before you can purchase a new system that uses USB for everything and realizes USB's full potential. 

The USB-powered Digital Sound System 80: Music to our ears

When Microsoft was developing Windows 98 with its built-in support for the new Universal Serial Bus (USB) support, they realized that there weren't many USB devices on the market. So, they decided to develop some of their own USB devices. We recently had the opportunity to preview a few of them.

In this article, we'll take a look at Microsoft's USB-powered Digital Sound System 80—a three-piece, 80-watt PC audio system—and share our experiences. As we do, we'll explain how this sound system enhances the overall Windows 98 experience.

Introducing the Digital Sound System 80

The Digital Sound System 80, with its Philips Electronics wOOx subwoofer, was definitely the most exciting offering among the Microsoft USB devices that we looked at. What makes this sound system so intriguing is that the high-speed USB channel allows the system to completely bypass your sound card and pull full-bandwidth, uncompressed digital audio directly from the source to the subwoofer box. Once there, the built-in digital amplifier converts the digital audio signals into analog signals for a clean, crisp sound—the likes of which you've never heard from your PC.

By using USB to bypass the sound card and then converting the digital audio signals into analog signals outside of the PC, the Digital Sound System 80 bypasses all the digital "noise" of a functioning PC. The digital noise inside your PC intro-

duces interference and compromises the quality of the analog sound produced by a regular sound card.

When you first listen to the Digital Sound System 80, you'll be amazed at the sound quality coming from your average Wave files and high-quality MIDI files. If you play computer games, chances are you'll discover sounds that you never heard before. In addition, reference CDs such as Encarta, sound files on the Internet, music CDs, and other audio sources will be much crisper and clearer through the Digital Sound System 80.

System requirements

In order to use the Digital Sound System 80, your system must meet the following requirements:

- A multimedia PC with a Pentium 166MHz processor or higher
- A USB port for use in digital mode or a Sound Blaster-compatible audio card for use in analog mode
- Microsoft Windows 98 operating system
- A double-speed or faster CD-ROM drive, or a DVD-ROM drive capable of playing digital audio
- 16MB of RAM
- 2MB of available hard disk space