



USB FAQs

For more information about USB, visit www.apple.com/USB

Q: What is USB?

A: The Universal Serial Bus (USB) delivers high-performance plug-and-play attachment of peripherals. Macintosh computers equipped with USB will allow up to 127 devices to be automatically configured as soon as they are physically attached (hot-plugged), without the need to restart or put the computer to sleep.

Q: Who developed USB?

A: USB was developed by the personal computing and telecommunications industries, including such companies as Compaq, DEC, IBM, Intel, Microsoft, NEC, and NorTel (Northern Telecom).

Q: Why is Apple adopting USB?

A: USB complements and builds on the traditional ease of use and plug and play associated with Macintosh computers. USB will provide Apple customers with many significant advantages, and enable them to take advantage of the huge number of USB peripherals expected to appear in the market over the next few years. More than 450 companies are adopting the USB standard. A complete list of these companies can be found on the web site <http://www.usb.org/developers/index.shtml>.

Q: Is Apple's implementation of USB proprietary or does it follow the USB standard?

A: Apple's implementation of USB will follow the industry-standard USB specification. The USB specification is available from the USB Implementers Forum web site at <http://www.usb.org/developers>.

Q: How does USB work?

A: After installing a device driver the first time, the Macintosh user won't have to do anything but plug in the device. When the device is plugged in, the Macintosh system identifies it and automatically loads the software driver to make it functional. In fact, the user can plug or unplug a device at any time, without having to restart the computer or put it to sleep.

Q: What are some of the advantages of USB?

A: USB provides up to 12-megabit-per-second data transfer; is extendible to support up to 127 external devices; features hot-plug, unplug, and auto configuration; and supports a wide variety of devices.

Q: How fast is USB?

A: USB offers data transfer rates of up to 12 megabits per second, much faster than the Apple Desktop Bus (ADB) ports (10 kilobits per second) and traditional Apple serial ports (230 kilobits per second).

Q: What kinds of USB peripherals will I be able to attach to my Macintosh?

A: Numerous devices can take advantage of USB such as digital cameras, modems, keyboards, mouse devices, joysticks, gamepads, removable storage devices, scanners, and printers. Because of the increased data rate of USB compared with ADB and Apple serial ports, Apple expects numerous new "first time" solutions to become available as well.

Q: Will USB increase the cost of Macintosh computers or peripheral devices?

A: USB chip sets built into the iMac computer are designed to be very low cost. Thus, USB should not significantly affect the cost of Macintosh computers or peripherals. The cost of peripherals could in fact decrease. USB provides power on the bus, so low-power devices will not require an AC adapter, which could reduce the cost of delivering the product to the market. Also, because USB devices are auto-configuring and physically identical for every platform, the cost of owning and operating peripheral devices is expected to be less than today's peripherals.

Q: Will USB be an addition to Macintosh computers or replace existing ports?

A: Apple's products are designed to uniquely satisfy the needs of its customers. Based on price, performance, and value, Apple will offer I/O ports that are best suited to each product. However, it is Apple's intention to replace ADB and serial ports with USB ports over time.

Q: When will ADB and Apple serial ports disappear?

A: While USB will not replace traditional I/O ports overnight, customers will see products from Apple that include only USB and some with USB and traditional I/O ports, as it completes its migration to USB. The simplicity and enhanced performance of USB will quickly become the preferred means of connecting peripheral devices. Higher-speed devices such as digital video camcorders and mass storage drives will be supported by a faster interconnect standard known as the FireWire serial bus (IEEE 1394).

Q: How does USB compare with the FireWire standard?

A: USB's data rate (12 megabits per second) is more than adequate for many common, low-cost applications such as keyboards, mouse devices, joysticks, game controllers, printers, etc., and is much less expensive to implement than FireWire. However, USB is not intended for ultra high-performance peripherals such as digital video camcorders, DVD players, and high-speed disk drives; the data rate of the FireWire bus (200 megabits per second, and soon 400 megabits per second) is much better suited. Because of their complementary nature, both standards will be aggressively adopted by Apple in its future products.

Q: Will Apple ultimately replace USB with FireWire?

A: No. The two technologies are complementary and uniquely suited to particular types of peripheral devices.



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Q: How many USB peripherals can be connected at once?

A: The USB specification allows up to 127 individual USB peripherals to be attached to a single CPU at one time. Only one port is required on the CPU, although most CPUs will feature two ports. Hubs are used to extend the number of ports from the CPU.

Q: What is a USB hub?

A: The purpose of a hub is to extend the number of ports on a USB without the need to open the Macintosh computer to install and configure an adapter card. USB hubs provide one upstream port (and cable) that attaches it to the bus coming from the Macintosh. Hubs can feature any number of “downstream” ports into which other USB devices can be attached, including other hubs. Most hubs feature four or seven downstream ports.

Q: I've heard hubs can be bus-powered or self-powered. What is the difference?

A: The USB specification requires that power be provided on the bus for use by low-power devices. Hubs can utilize this power for operation, and are thus referred to as “bus-powered” hubs. Hubs may also include an AC adapter that provides external power to the hub. Such hubs are referred to as “self-powered” hubs. Some hubs may be included within other devices such as displays, keyboards, and printers. Such devices are known as “compound” devices.

Q: How do I know whether to use a bus-powered hub or a self-powered hub?

A: According to the USB specification, no two bus-powered hubs can be connected directly together. In such a case, the downstream hub (farthest from the CPU) may not be able to provide the minimum power required to each of its downstream ports. To extend the USB properly, users will alternate self-powered and bus-powered hubs, or use only self-powered hubs, whichever they prefer.

Q: Do I always need to purchase a hub to go with my Macintosh computer with USB?

A: No. With USB, a customer can hot-plug or unplug a device at any time without having to put the computer to sleep or restart it, so any number of devices can be used in just one port. A hub is only necessary when a customer wants to use several devices at the same time or for convenient access to a USB port (instead of the rear panel of the computer). Apple ships its CPUs with a combination hub/keyboard that provides two additional ports.

Q: What does a USB cable look like?

A: USB cables are called “A to B” cables, because they feature the two standard USB connectors, known as Type A and Type B. Type A connectors are small and rectangular, and are used to plug a device into the back of a Macintosh or other computer. Type B connectors are square, and are used to attach a USB cable to a USB device. Having two dissimilar connector types prevents wrong connections.

Q: What is the maximum length for USB cables?

A: The maximum length for a USB cable is 5 meters. The most common lengths are 2, 3, and 5 meters. Cables with shielding and two twisted-pair conductors are considered “fully rated” to transfer data at the maximum 12 megabits per second. Nonshielded cables with nontwisted conductors are allowed, but are used when they are soldered to a device that will transmit only at the lower 1.5-megabit-per-second transfer rate. Low-speed cables can be a maximum of 3 meters in length.

Q: Will Apple support legacy I/O devices attached through USB?

A: While it is possible for some devices to be adapted for use through USB on a Macintosh system, it may not always be practical. Apple is aware of several third parties that are investigating solutions for customers who want to continue to use their existing peripherals through USB on a Macintosh, but will not preannounce any.

Q: Will Apple support generic USB class drivers?

A: Generic class drivers allow a variety of products to be attached to a computer through USB and operate in a limited fashion. Although the device might function in some respects, features unique to a particular device would require a specific USB software driver to enable these features. At this time, Apple is not delivering generic USB class drivers in the Mac OS, but will include third-party device-specific drivers with its USB-enabled CPUs and Mac OS reference releases.

Q: Will Apple produce USB peripherals for the Macintosh?

A: Apple has traditionally offered keyboards and mouse devices with its CPUs and will therefore also offer a USB-based keyboard and mouse for iMac. While Apple cannot comment on future products, it reserves the option to produce USB peripherals for Mac OS computers to satisfy the requirements of its customers.

Q: Where can I find USB products for the Macintosh computer?

A list of shipping Mac OS-compatible products is available on the Web at <http://www.macsoftware.apple.com>, including products that utilize USB. In stores, customers can look for products that carry the Mac OS-compatible and USB logos. Products that display only the USB logo may also work. Customers should contact the product manufacturer to determine compatibility with the Mac OS.