WSY Universal Serial Bus FAQ

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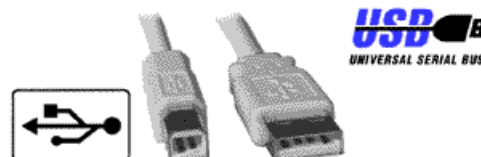
General USB Information

This FAQ page is specific to WSY systems, on issues that aren't covered in the following documents. If you don't see your question on this page, you may well find it answered by the following documents and sites.

WSY USB Transition slides

For more general USB FAQs, see the following links:
USB Implementors Forum FAQ: http://www.usb.org/faq.html
USB Workshop FAQ: http://www.usbworkshop.com/faq.htm

Q. *Is there an alternative to the scroll mouse?*
A. Yes. For a limited time, WSY will provide a plain 3-button USB mouse to any customer who has a 3-button scroll mouse (or the order number for a scroll mouse not yet received).

For more detail see URL:
http://www.unixworkstations.com/Home/products/ux/ux_mouse/mouse.html
A clone of that page, available behind the HP firewall, without registration, is on this site here.

Q. *Why did WSY adopt USB?*
A. The B1000/C3000/J5000/J7000 "Maestro" product family do not have the HP-GSC bus, and the former WSY "LASI" super I/O chipset required GSC. This forced a change of super I/O chips, and opened the opportunity for evaluation of alternative console ports.

At that time, it was forecast that USB would eclipse PS/2 during the lifetime of the Maestro products. Although delays in the (otherwise unrelated) release of Windows NT 5 (now called Windows 2000) have delayed the market adoption rate of USB to some extent, USB will still become the dominant console interface during the life of the Maestro core electronics.

Q. *Why was PS/2 dropped when USB was added?*
A. The LASI chip was replaced by an industry-standard "super I/O" chip (the National PC87560). PC super I/O chips are internally completely different from the former WSY LASI implementation. This and other changes forced a re-write of the built-in port drivers, including parallel, serial, audio and PS/2.

To both re-write PS/2 and add USB would have put the development schedule at risk. Implementing only PS/2 was seen as short-sighted, so we elected to be forward-looking and support only USB.

Furthermore, USB(host)-to-PS2(device) adaptors were likely to be available, whereas {anything}-to-USB(device) adaptors (other than PCI cards) are impractical if not impossible. You can get to PS/2 from a USB-only host. Getting to USB from a PS/2-only host would consume a valuable PCI slot.

Q. *Can I connect an ergo keyboard?*
A. Yes. There are two ways to connect alternative keyboards.
1. USB: Native USB keyboards are available in the retail market, including various designs claimed to provide ergonomic benefits.
2. PS/2: You may also be able to use any legacy keyboards you already possess, or attach new PS/2 devices not yet available in native USB, using the Y-Mouse adaptor.

It is important to test any non-HP devices before deploying them. There is a chance that some keyboards may not function properly on our systems.

WSY has considerable experience using the Microsoft Natural Keyboard Elite, a sculpted ergo design. Note: Only the retail versions of this keyboard are assured to be USB-capable. OEM versions of the Elite may not include the PS/2(receptacle)-to-USB(plug) adaptor cable, and may not include USB capability in the keyboard (which, in case you were curious, is delivered on the "unused" pins of the PS/2 mini-DIN connector - the adaptor cable is entirely passive). WSY has not yet tested the newer *MS Natural Keyboard Pro*.

Q. *How can I connect a legacy PS/2 device?*
A. Note: The following is not officially supported.

There are several USB(host)-to-Legacy(device) adaptors on the market, including USB-parallel, USB-serial, USB-LAN, USB-SCSI and USB-PS/2.

The USB-PS/2 adaptor that WSY has the most experience with, shown to the right, is the "Y-Mouse" (http://www.ymouse.com/product/pymmousekey.htm) from P.I.Engineering (http://www.ymouse.com/). The Y-Mouse connects upstream to a USB port on an SPU or USB hub, and provides two PS/2 mini-DIN ports for devices downstream.

The Y-Mouse will not work as boot console on systems with firmware revisions below 1.9. With 1.9 or later, most types of PS/2 keyboards and PS/2 mice are recognized, and function correctly as console devices.

The Y-Mouse has two unexpected and beneficial properties:
1. Either or both ports may be used for keyboard or mouse.
2. Once a PS/2 device has been connected, the Y-Mouse reports that it is still there on USB side, even if the device has been disconnected. This adds some robustness needed by the KVM questions below.

Although not officially supported, WSY has invested engineering effort to make the Y-Mouse work properly. However, there are likely some devices (and PS/2 KVM switches) which do not work correctly with the Y-Mouse and/or Maestro systems.

It is the responsiblity of the party configuring the system to determine whether or not any USB adaptor provides the intended functionality in a reliable manner.

Q. *I'm using a PS/2 keyboard on a Y-Mouse. I want to use a USB mouse, but the system doesn't see it. What's the problem?*
A. Search order.
The unused Y-Mouse PS/2 port is apparently reported as a USB mouse. To fix this, merely swap the SPU USB ports you are using for Y-mouse and USB mouse. If you are using USB hubs, move the USB mouse closer to the SPU in the tree.

Q. *What is the WSY recommended USB hub?*
A. The recommended hub is the HP `D6804A`. This is a four-port line-powered high-speed hub (that works only with line power). For more information, see URL:
http://www.hp.com/desktops/products/accessories/generated/D6804A.html

This hub is presently being extensively tested on WSY systems, and official support may be available shortly.

Q. *How far I can extend a keyboard and mouse?*
A. Short answer: 30m total maximum.
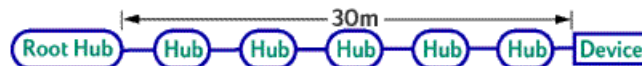
Hedged answer: further if you use legacy devices.

Long answer:
Extension of USB connections is strictly limited by the specification, for reasons having to do with signal propagation and response times.

Using only "high-speed" USB cabling and hubs, the maximum is 5m per segment, and a tree depth of six segments. See pages 7 and 8 of the customer slides for illustrations. WSY's recommended hub is the `D6804A`, a line-powered high-speed hub. WSY is presently evaluating a 3rd-party "active USB extension" cable, which may deliver a single-port 5m segment more economically.

Do not make up cables over 5m in length. Do not use passive A(plug)-to-A(receptacle) USB extension cords. These are quite likely to *not work*.

As a historical curiousity, the 30m limit of USB is the same as HP-HIL's.

Q. *How can I extend USB further than 30m?*
A. Using only USB devices, you can't. Although a remote USB bridge (like the HP 37304A HP-IB repeater) is theoretically possible, none have appeared in the market, and may not.

A work-around, for keyboard/mouse only, may be to use PS/2 devices in this role, and employ:
  ○ The maximum USB tree depth.
  ○ A USB-PS/2 (Y-Mouse) adaptor.
  ○ Such PS/2 extenders and/or repeaters as already exist in the market.

Q. *How can I add a Maestro system to an existing KVM?*
A. Short answer: Y-Mouse

Existing Keyboard-Video-Mouse switchboxes and controllers assume a PS/2 connection. Using the Y-Mouse both converts the host USB to something the box can use, and avoids the detach/re-attach problem on USB (see next question), by taking advantage of the propensity of the Y-Mouse to simulate PS/2 device presence even when the PS/2 device is switched away.

The topology is:
Host(USB)==to==(USB)Y-Mouse(PS/2)==to==(PS/2)KVM==to==(PS/2)Keyboard/Mouse

Note: Not all versions of all brands of PS/2 KVMs work properly with the Y-Mouse and WSY systems. As we learn more, we may have recommendations. In the meantime, test and verify.

It is the responsiblity of the party configuring the system to determine whether or not any KVM provides the intended functionality in a reliable manner.

Q. *Where can I get a USB KVM?*
A. Short answer: You can't, yet.

Long answer:
The only USB KVM switches so far announced are from BlackBox. The Models KV812A, '814A, '822A and '842A were just announced on 1999.09.09. WSY has contacted BlackBox to obtain evaluation units, but so far it appears that these are simple electronic switching hubs, that cause a detach/re-attach upon switching, and thus may not work properly on WSY systems. Use the Y-Mouse and an active PS/2 KVM in the meantime.

Other USB switches also exist. So far, the only units we've seen are simple mechanical switches. None appear to be sophisticated electronic devices that mimic device presence even when one or more hosts is not presently selected.

USB, being a hot plug'n'play connection, would seem to be ideal for a simple mechanical console switch. Unfortunately, there is no USB Specification, Recommendation or even RFC for system behavior when the console disappears and re-appears.

Active: Consequently, the only safe practice is for the switch to pretend that the keyboard and mouse are still connected to system "A" even when system "C" is currently selected (i.e. an "active" USB KVM, which the new BlackBox USB units are not).

It is the responsiblity of the party configuring the system to determine whether or not any KVM provides the intended functionality in a reliable manner.

- Q. *Can I add USB to older WSY systems?*
- A. Not in a supported manner.

The USB kernel support was coded to work with generic OHCI USB controllers, and all OHCI USB PCI cards we've tested so far seem to work. None are supported. If you have a business need to support USB on older platforms, or have multiple USB root hubs on the Maestro platforms, please contact the factory.

Cautions:
- UHCI cards won't work at all. Cards using the VIA VT83C572 chipset are UHCI. Cards using the Opti 82C861 chipset are OHCI.
- Most USB PCI cards are 5V only, and not Universal (5+3.3v) or 3.3V-only, due to the need to supply 500mA at 5V to each USB port. You won't be able to use a 5V PCI USB card in a 3.3v-only PCI slot.
- More than two ports on card? Although OHCI allows up to 127 ports on a root hub, most root hub chips are only two-port, and the cards have a second on-board hub. This reduces the depth of external hubs you can connect, from 5 to 4, which in turn, reduces the max distance to the furthest device from 30m to 25m. If the card has a small TI chip, in addition to the main USB chip, then it likely has two hub levels.

Aside: SCSI(host)-to-USB(device) and LAN-to-USB adaptors are unlikely to ever exist, due to some key architectural assumptions in USB. Similarly, in the PC market, ISA-to-USB, EISA-to-USB and MCA-to-USB cards will likewise not exist. PCI and PCMCIA card-based USB controllers are the only game in town so far (the built-in hubs are all PCI-based), and this situation may not change for some time to come.

F.A.Q., pronounced "fack", stands for Frequently Asked Questions.
The actual point of a FAQ is FSAs (Frequently Supplied Answers)

Go to hosting home page (http://www.patriot.fc.hp.com/rjn/).
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