

LINK

Lava I/O News

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System Upgrades

Why Upgrade?

Why upgrade a system with new I/O ports? Because, perhaps more than any other type of enhancement, I/O upgrades add to the value of a system. Not only do they take advantage of expansion capacity already waiting on most computers' motherboards, they can help blend the power of a computer with the unique abilities of peripherals such as high-speed scanners or digital video cameras.

I/O upgrades can extend the life of systems that are no longer new. First, interface technologies that have recently appeared, such as FireWire® or USB 2.0, can be added to an existing system. They make it possible to use the newest peripherals, such as digital video cameras and high-speed external hard drive enclosures. These interfaces are usually faster and more convenient to use than earlier technologies. Second, older systems can be made more versatile and configurable with I/O upgrades. Are all your PCI expansion slots full? Lava has ISA serial and parallel port boards for the ISA slots on older systems. Are Plug and Play PCI cards not working with DOS applications? ISA boards are jumper-configurable, and can be configured to suit the DOS application you need to run.

New systems can also benefit from I/O upgrades. In some cases, new "legacy-free" systems have no serial or parallel ports at all. Freedom from legacy ports means freedom to throw away perfectly good printers, scanners, modems, external drives, and other peripherals that depend on these ports. Who needs that kind of freedom when Lava I/O boards can add serial, parallel, USB and FireWire® ports?

Many I/O upgrades can also add faster versions of ports already in a system: the 16650



UART serial ports in Lava's LavaPort serial board family are four times faster than the standard 16550 UART serial ports found on most motherboards. A PCI-bus EPP parallel port, such as the Lava Parallel-PCI, will be up to three times faster than an ISA-bus motherboard parallel EPP port. And don't forget the convenience of having all the ports you need—why crawl under your desk to plug and unplug printers when you can just add a parallel port?

When to Sell Upgrades

Upgrading a system is not simply a matter of filling an immediate need. Upgrades generally make economic sense when the need for more or faster ports has been identified, and before the computer in question has become very old. In general, the technology in an upgrade should match the level of the system as a whole. For example, it simply doesn't make sense to add USB 2.0 ports to a system that will not run the operating systems needed for USB 2.0 support.

From a reseller's point of view, this means that selling upgrades usually happens with the initial sale of a system, or within the following

year and a half. It's a good idea to determine a customer's uses for a system as they buy it, and then to suggest upgrades on the spot. Follow up once the system has been in use for a short while, in case it is being put to a new use that would benefit from an upgrade.

Sometimes selling peripherals drives the upgrade: digital cameras or digital video cameras might need USB or FireWire® connections. If a customer is buying a second printer, maybe they could use a second parallel port.

Upgrading Tips

Before upgrading hardware:

✓ Check the hardware fit. Make certain the system has the slots required for your upgrade, and see that they are the right type. Are you adding a PCI or an ISA card? Are the PCI slots the 32-bit slots Lava cards use? If you are short of slots, you might be able to free a slot of the type you need by rearranging cards in PCI slot one, as that slot might share its chassis exit point with an ISA card. Also, check whether the computer's case is regular height or low-profile: you might require a low-profile PCI card.

✓ Check that operating system support exists for the technology you are adding. Serial and parallel are broadly supported across systems and platforms, although specific drivers may not always be available. IEEE 1394 (FireWire®) and USB 1.1 are natively supported in Windows® 98SE and later, in Mac® OS 8.6+, and in Linux kernel 2.4+. USB 2.0 is currently supported in Windows® 2000 and XP, after driver downloads from Microsoft.

✓ Check the hardware resources available in the system. In particular, determine that the system has an available IRQ for the board you are adding. To do this in Windows® 95 and 98, go to the Device Manager and double-click on "Computer" at the top of the Device Manager hardware tree. Windows® 2000 and XP automatically and generally effectively allocate IRQs. Their IRQ use can be seen by selecting "View | Devices by Type" in Device Manager.

✓ Check that the operating system you have in place uses the latest patches and service packs. In many cases, support for I/O technologies is incremental: an operating system might initially support some aspects of a technology, and add other support over time.

✓ Check that the system has BIOS and motherboard support for the hardware you are adding. Requirements will vary system-to-system, but in general you should check that you have the most up-to-date BIOS firmware (check your motherboard manufacturer's web site for new firmware), a compatible chipset (some information can be found at www.lavalink.com), PnP support for PCI cards, and PnP enabled in the BIOS. Also check your motherboard's manual for slot information; simply put, slots on a motherboard are not always equal even though they may look alike.

Before upgrading the operating system:

✓ Check the availability of device drivers for the operating system you intend to use. Not all hardware has drivers written for every operating system. Upgrading an operating system may mean some hardware will need new drivers to operate. In the case of Lava I/O cards, check the Lava web site for driver and compatibility information.

✓ Check that the devices' functionality will not be impaired by the characteristics of the

new operating system. For example, if you need a DOS/legacy address for the card you wish to use (eg. 278h, 378h, 3BCh) you will probably need the ability to modify the resource settings for the card. Doing this could be difficult with Windows® 2000 or XP, which limit a user's ability to directly modify the resources assigned to a piece of I/O hardware. These operating systems assign IRQs and I/O addresses automatically, and those settings cannot be modified by the user. The reduced role for user intervention means that fewer configuration errors will occur, but it may be difficult to get an expansion card to use a legacy address.

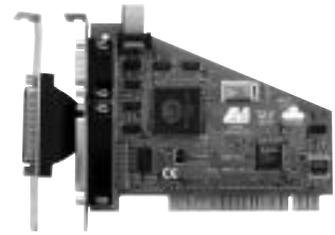
✓ Check the operating system vendor's site for patches and service packs. Frequently, operating systems are released with partial implementations of new technologies. Updated or revised I/O support often comes in patches or service packs issued after the operating system has been released. A couple of Windows® examples will illustrate this point. In the first case, Microsoft now provides an update package for Windows® 98SE that installs a safe device-removal utility allowing users to stop an IEEE 1394 (FireWire®) Plug and Play storage device such as Lava's FireDrive® safely, before physically unplugging the device. In the second case, in March 2002 Microsoft published USB 2.0 drivers for Windows® XP, an operating system that was initially released in October 2001.

✓ Check technology associations for news and information, specifications, and occasional test utilities for assessing compatibilities. Technology associations (as well as operating system vendors) set standards and provide assistance that influences operating system upgrades. FireWire® (IEEE 1394) is governed by the Institute of Electrical and Electronic Engineers, who determine the interface specification. News and technology details on IEEE 1394 can also be found at the web site of the 1394 Trade Association. The IEEE also sets the IEEE 1284 standard for parallel port interfaces. USB interface standards are set by the USB Implementers Forum, and serial port standards are set by the Electronic Industries Association/Telecommunications Industry Association (EIA/TIA). For PCI interface cards, the PCI Special Interest Group defines bus standards.

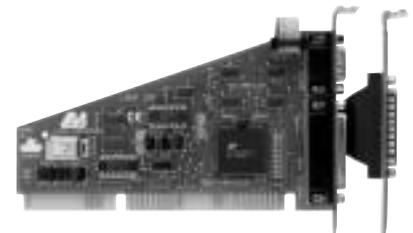
Popular Upgrade Cards



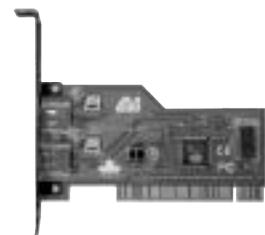
SP-PCI



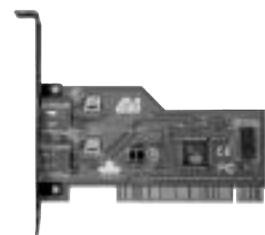
2SP-PCI



2SP-ISA



USB 1.1 Host Adapter



FireHost

Organizations Setting I/O Standards

IEEE (Institute of Electrical and Electronic Engineers) Standards Association: www.standards.ieee.org The IEEE-SA publishes electrical and electronic standards — such as those for FireWire® (IEEE 1394) or parallel (IEEE 1284) interfaces — that improve the ability of corporations to pursue consensus on technical issues.

1394 Trade Association: www.1394ta.org The 1394 Trade Association promotes the IEEE 1394 Serial Bus standard technology into the computer, consumer, peripheral, and industrial markets to enable an interoperable, standardized, universal I/O and backplane interconnect.

USB Implementers Forum: www.usb.org The USB-IF provides a support organization and forum for advancing and adopting Universal Serial Bus technology. The Forum facilitates the development of USB peripherals, and promotes the benefits of USB.

Electronic Industries Association: www.eia.org An umbrella organization of over 2,300 member companies, representing the U.S. electronics industry and setting standards for telecommunications, consumer electronics, electronic components, and other related technologies. In conjunction with the Telecommunications Industry Association, the EIA defines the standards for serial data transfer (including EIA/TIA-232-F, the current standard for RS-232 serial interfaces).

PCI Special Interest Group: www.pcisig.com The PCI Special Interest Group (PCI-SIG) delivers a standard for PCI devices. The PCI specification is an open industry standard.

On-Line Resources to Assist in Upgrading System

Microsoft assists people evaluating systems for Windows® XP compatibility:

www.microsoft.com/windowsxp/pro/howtobuy/upgrading/advisor.asp

The Upgrade Advisor is a tool that checks your system hardware and software to see if it is ready for upgrade to Windows® XP professional. It can be run online or downloaded and run locally.

The USB Implementers Forum, the organization governing the USB specification, has a number of tools useful for evaluating systems' suitability for upgrading to USB:

www.usb.org/developers/tools.html

This page has installation utilities for testing USB devices with Windows® 2000 and XP.

USBCV Beta 2 - Windows® 2000 and Windows® XP only

This installation utility contains a USB Command Verifier that evaluates High, Full and Low-speed USB devices for conformance to the USB Device Framework, Hub Device Class, and HID specifications. It works with Windows® 2000 and XP.

USBCheck.exe - Windows® 2000 only

This installation utility contains USB Check version 5.1. Note: USBCheck is being made obsolete by the USB Command Verifier described above.

www.usb.org/faq/ans3.html

This page has USBready.exe, for assessing a system's USB support under Windows® 98 or 98SE. This utility examines a PC's hardware and software and indicates the PC's USB capabilities. The USB Implementers Forum also offers the following rough guidelines: PCs made during or before 1996 probably don't support USB. PCs made during 1997 probably do support USB. PCs made during or after 1998 almost certainly support USB.

Congratulations to the winner of the Parallel-PCI in the March newsletter contest:
Joseph Lore, EWS Computer Emporium, Manchester NH

Profile

Access 8 is an importer and national distributor of networking products and computer peripherals. From an initial product catalog of thirty items in 1985, Access 8 has grown to now servicing resellers with over 1600 products.

The company's success has been achieved with a high level of quality products, service, and knowledgeable staff offering personalized service and competitive pricing.

From their warehouse in Concord, Ontario, Access 8 stocks one of the largest inventories of Cat 5e, Cat 6 and fiber patch cables. The company offers information and products for an end-to-end networking solution. Access 8's cable offerings also include SCSI, parallel, serial, FireWire®, USB, modem, power, IDE, monitor, and just about any other type of cable and connector you might need.

Peripheral products include adapters and gender changers, drive accessories, mice, multimedia equipment, switch boxes, testers and toll kits, and a wide range of other accessories.

Access 8 also carries an extensive line of branded products, including Koblenz Battery Back Ups, Goldx USB and FireWire® products, Plus Cabling, Rayovac batteries and of course Lava I/O boards.



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PRODUCT SUMMARY

Serial Boards

| | | |
|--------------|----------------|--|
| PCI | SSerial-PCI | Single 9-pin serial, 16550 UART |
| | SSerial-PCI/LP | Single 25-pin serial, 16550 UART, low profile |
| | DSerial-PCI | Dual 9-pin serial, 16550 UARTs |
| | DSerial-PCI/LP | Dual 9-pin serial, 16550 UARTs, low profile |
| | Quattro-PCI | Four-port 9-pin serial, 16550 UARTs |
| | Octopus-550 | Eight-port 9-pin serial, 16550 UARTs |
| | LavaPort-650 | Single 9-pin serial, 16650 UART |
| | LavaPort-PCI | Dual 9-pin serial, 16650 UARTs |
| | LavaPort-Quad | Four-port 9-pin serial, 16650 UARTs |
| | ISA | SSerial-550 |
| DSerial-550 | | Dual 9-pin serial, Com 1-4, 16550 UARTs, IRQ 2/3/4/5/7/10/11/12/15 |
| RS422-550 | | Dual 9-pin serial, 16550 UARTs, RS422 pinout |
| LavaPort-ISA | | Single 9-pin serial, Com 1-4 16650 UART, IRQ 2/3/4/5/10/11/12/15 |
| LavaPort-PnP | | Single 9-pin serial, 16650 UART, plug and play |

Parallel Boards

| | | |
|-----|-------------------------|--|
| PCI | Parallel-PCI | Single EPP parallel |
| | Parallel-PCI/LP | Single EPP parallel, low profile |
| | Dual Parallel-PCI | Dual EPP parallel |
| ISA | Parallel Bi-directional | Single bi-directional parallel port, LPT 1/2/3, IRQ 5/7 |
| | Parallel-ECP/EPP | Single ECP/EPP parallel, LPT 1-6, IRQ 2/3/4/5/7/10/11/12 |

Combo Boards

| | | |
|-----|---------------|--|
| PCI | SP-PCI | Single 9-pin serial, 16550 UART + single bi-directional parallel |
| | 2SP-PCI | Dual serial (9 & 25-pin), 16550 UARTs + single EPP parallel |
| | LavaPort-Plus | Dual serial (9 & 25 pin), 16650 UARTs + single EPP parallel |
| ISA | 2SP-550 | Dual 9-pin serial, Com 1-4, 16550 UARTs + single bi-dir. parallel, LPT 1-2 |

USB 2.0 & 1.1 Devices

| | |
|----------------------|--|
| USB 2.0 Host Adapter | Dual USB 2.0 ports, 480 Mbps, fits in PCI slot |
| Kazan | Hard drive enclosure with USB 2.0-to-IDE interface |
| USB 1.1 Host Adapter | Dual USB 1.1 ports, 12 Mbps, fits in PCI slot |
| SPH-USB 1.1 Hub | Three powered USB ports, parallel port, serial port, connects to USB |

IEEE 1394 (FireWire®) Devices

| | |
|--------------------------|--|
| IEEE 1394 FireHost | Dual IEEE 1394 ports, 400 Mbps, fits in PCI slot |
| FireDrive® | Hard drive enclosure with FireWire®-to-IDE interface |
| IEEE 1394/IDE Controller | FireWire®-to-IDE hard drive interface |

Specialty Boards

| | | |
|-----|----------|-------------------------|
| PCI | 8255-PIO | 8255 PIO interface card |
|-----|----------|-------------------------|



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