

# LINK

Lava I/O News

## Inside this issue:

- PC-Based POS Systems
- Lava's Multi-Port Serial Lineup
- Restaurant Touch-Screen POS
- Basic POS Hardware
- Distributor Profile



## PC-Based POS Systems

Over the last couple of years Lava has used its extensive background in serial port technology to develop a line of highly respected multi-port serial boards. They include the DSerial-PCI, the LavaPort-PCI, the Quattro-PCI, the LavaPort-Quad, and the Octopus-550. These boards set the standard in multi-port serial cost-effectiveness, ease of use, and reliability.

People unfamiliar with multi-port boards initially wonder why anyone would want four, eight, or even more serial ports in a single system. The answer is simple: think of gas stations, checkout counters, and cash registers. These are usual settings for Point-of-Sale (POS) systems. A typical checkout counter might have any of the following: a cash drawer, a receipt printer, a weighing scale, a bar code scanner, a credit card reader, a modem, and a cash display. Attach each of these devices to a computer, and it suddenly becomes obvious that the usual PC motherboard, with just two serial ports, can't do the job. Multi-port boards are the best way to maximize the limited PCI slot real estate and precious system resources that most computers have. Also, they are a far more cost-effective way to add ports than simply adding more computers.

POS systems, and their close relations the kiosk systems, seldom need the higher-bandwidth ports offered by USB and IEEE 1394: using these technologies would be like driving to the corner store in a Formula 1 race car. On the other hand, PCs do need to use their hardware configuration resources sparingly. For this reason, Lava multi-port boards are designed to use just one system interrupt, regardless of the number of ports they have. In addition, PCI slots are optimized. With an Octopus-550 board, for example, you can have eight serial ports on a single PCI slot, and multiple Octopuses (or is it Octopii?) in a system.



Multi-port boards are also widely used in modem pools. Again, serial ports are a natural and effective technology for connection. North American modems usually don't need more than the 115.2 kbps of speed that is available with a 16550 UART serial port, but when ISDN modems and the newest V.92 modems are used, the LavaPort-PCI and LavaPort-Quad fill the need perfectly. With their 16650 UART serial ports, the LavaPorts have speeds of up to 460.8 kbps per port.

### What goes into a PC-based Point-of-Sale system?

Many POS systems are built on a PC platform, with specialized hardware and software to give added functionality. A PC-based POS system is simply a basic PC supplemented with specialized printing abilities, purpose-specific data input and display hardware, cash handling capability, and so on. While such systems may appear somewhat more complex than the average PC, they are actually not difficult to assemble and configure. What's more, from a system builder's or system reseller's point of view, they are one of the best ways to add value to a sale. Customers buying POS systems are almost always interested in

fully operational and configured systems. These customers, when happy with their systems, can generally be counted on for repeat business and maintenance contracts. Doing POS systems right can be a very good business, as numerous smart VARs can attest.

The hardware requirements for PC-based POS systems are generally straightforward. As most POS systems do not need the processing power and speed of high-end PCs, many POS builders build systems using the least expensive motherboards and processors on the market. This is no comment on the hardware's reliability or suitability to the job: these POS systems are still highly dependable and effective. However, avoiding expensive bleeding-edge components helps keep selling margins very attractive.

The other POS components are standard commodities available from a number of manufacturers, and are controlled by POS software. A POS system could also interface with accessories like handheld digital inventory devices. The point is: the average PC is not equipped on its own with enough I/O ports to handle the peripherals a POS system demands.

Here is where Lava comes in: Lava's multi-port serial boards, combo boards, and USB boards are the best choice for POS system builders who want to add highly reliable interfaces that will install smoothly and run forever. Lava boards are designed to stringently conform to industry standards and protocols, ensuring a high degree of compatibility and interoperability with other manufacturers' hardware.

## Lava's Multi-Port Serial Line-Up

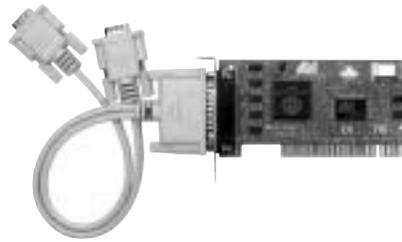
The DSerial-PCI gives PCs two 9-pin 16550 UART serial ports on one PCI board. Each port supports a throughput rate of up to 115.2 kbps. The two high-speed serial ports of the DSerial-PCI handle data from two different serial devices while sharing one interrupt. Lava's low-profile version of the DSerial-PCI is popular with builders of compact cash register systems.

When greater speed is required, as with ISDN modems or specialized medical imaging equipment, the LavaPort-PCI is a great two-port solution. It has two 16650 UART serial ports, each with up to 460.8 kbps of throughput and 32-byte FIFO buffers. With other features the same as the DSerial-PCI, the LavaPort-PCI is an ideal two-port serial accelerator.

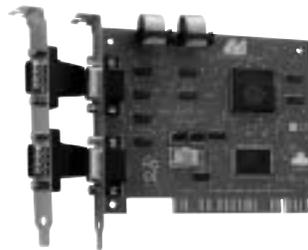
The Quattro-PCI is popular with many POS system builders. Lava puts four 16550 serial ports onto one PCI board, liberating lots of motherboard space. All the ports use only one IRQ, saving valuable computer resources. The Quattro-PCI helps eliminate conflicts among multiple serial peripheral devices attached to a PC. Users requiring additional serial port speed can use the LavaPort-Quad. It provides four 16650 UART serial ports, each with up to 460.8 kbps of throughput, and each with 64-byte FIFO buffers.

Finally, the Octopus-550 adds eight serial peripherals using one PCI slot with its fan-out (octopus) cable, which is included with the board. The Octopus-550 has data throughput rates up to 115.2 kbps and integrated 16 byte FIFO buffers on each port. Lava's multi-port serial cards all come with Lava's software for renaming COM ports, making these boards backwards compatible with older software that only supports COM 1-4. And, as Plug and

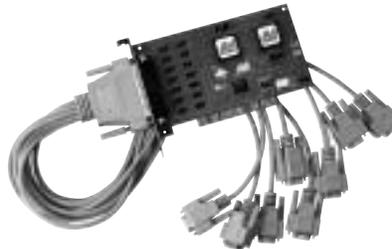
Play cards, they auto-configure I/O addresses. Any one complements systems needing additional serial ports.



DSerial-PCI/LP



Quattro-PCI, LavaPort-Quad



Octopus-550

## POS Restaurant and Hospitality Touch Screen System

Flexible configuration and standard, reliable operation make the Lava 2SP-550 an ideal choice for DOS-based Point-of-Sale systems. Do you want fries with that?

Flexible Solutions Inc. manufactures Golden Touch POS systems. Their POS systems are used in both large establishments and in smaller cafes and fast-food restaurants. Flexible Solutions' PC-based touch-screen POS stations help cashiers, bartenders, waiters, and telephone order personnel to enter and process food orders.

**The Ports Problem:** A Golden Touch POS system handles tasks that include order entry, password verification, status reporting, receipt and order printing, credit card authorization, caller ID display, continuous data backup, and timekeeping. Such a system can require as many as seven COM ports per station, although three or four COM ports are more usual. In some cases an additional parallel port is also needed beyond the single parallel port found on standard motherboards.

**The Solution:** Flexible Solutions' Jason Howard uses the Lava 2SP-550 board in the majority of systems he currently builds. The 2SP-550 is an ISA-bus board with two 16550 serial ports and one parallel port. One or two 2SP-550s fill the expansion needs of a typical POS station.

**The Configuration Problem:** Usually, Flexible Solutions installs these boards in 486-based motherboards, using ISA slots. Although not leading-edge technology, a 486 processor is cost-effective and can easily handle the processing required by the DOS-based software Flexible Solutions writes and installs. However, since the Golden Touch software is DOS-based, setting port addresses and IRQs for the numerous serial ports of a POS system can be difficult unless a board is flexible and configurable.

**The Solution:** The 2SP-550 is ideal here: its jumpers for setting port addresses and IRQs are plainly identified, and the board's operation is reliable and completely standard. PCI-bus expansion boards pose a problem for the systems Flexible Solutions builds because they automatically assign resources to a port, and those assignments may not match the assignments that the DOS software expects. As an ISA-bus board, the 2SP-550 is manually configurable to the specific requirements of Flexible Solutions' software.

**The Standards Problem:** The Golden Touch stations are all integrated across a network, with local or remote printers in such locations as kitchens, bars, and food preparation areas. High reliability and standardization are essential. As a result, Flexible Solutions Golden Touch System runs on standard PCs, on a PC network. Receipt printers and touch screens are industry standard "off-the-shelf" products, and Flexible Solutions, Inc. uses no proprietary hardware products.

**The Solution:** Flexible Solutions builds its touch-screen systems using Lava boards. They meet all relevant standards for data transfer and bus interfacing, and can be depended upon to install into any standard system without a hitch.

"You have a great product, I love it," Jason says. As motherboards with ISA slots become harder to source, Flexible Solutions is moving to Windows-based software running on PCI-bus motherboards. Lava's best-selling DSerial-PCI, Quattro-PCI, and 2SP-PCI are candidates for the next generation of Golden Touch POS devices.

## Basic POS Hardware

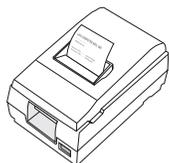
PCs with monitors, keyboards, and sometimes a pointing device such as a mouse are the basis for PC-based POS systems. Standardized interfaces between hardware and software, such as as OLE for Retail Point-of-Sale (OPOS), allow hardware from various manufacturers to easily interoperate.



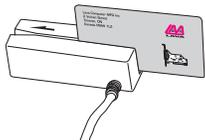
Barcode scanners read barcode information from labels or packaging, and save keying in information manually. CCD (Charge-Coupled Device) scanners are inexpensive and work well at close range with small and medium sized bar codes. Laser scanners are more expensive, but work with a wider range of sizes and barcode densities. Some barcode readers are wireless, sending data to a radio base station connected to the computer.



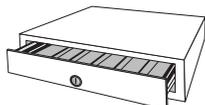
Pole displays show customers the details of a transaction as it occurs, and can usually be programmed through the POS software to also display scrolling promotional or greeting messages.



Receipt printers produce a hard copy of a sales transaction on either blank or preprinted paper. They are generally either impact or thermal printers. Impact printers are generally used to print multiple copies of a receipt.



Magnetic card swipers work with POS software to collect data recorded on a magnetic strip on a card. Data is usually recorded in a standard ABA/ISO/ANSI format, using up to three tracks. Magnetic card swipers are often coupled with modems for credit card verification, and can also be used for access control in security systems.



Cash drawers are controlled electronically by the POS software, and open only at appropriate moments in the sales transaction. Additional drawers can be added to hold loyalty program coupons.



Weigh scales work with the POS software to calculate pricing based on cost per unit weight, and are common in retail, cafeteria, and restaurant applications.

## Profile

ELCO Systems (Canada) was founded in 1992. From just one office in Markham, Ontario, the ELCO Group has grown into a full service national distributor. ELCO Group customers enjoy the detailed attention typical of a local distributor, yet benefit from the buying power of a national organization.

The ELCO Group's strong relationships with established manufacturers in North America, including Lava, as well as in the Far East means that they can reliably supply components and systems at very competitive prices. The ELCO Group distributes general computer components down to the board level.

In addition to components, the ELCO Group distributes its unique V8 Systems. V8 Systems will include Lava boards and all are CSA approved and 3Com Connected™. In 1998, V8 Systems were awarded the best combination of value and performance by *Canadian Computer Wholesaler*. All ELCO V8 Systems are 100% Canadian built in ELCO's ISO 9002 registered manufacturing facilities.

As well as V8 systems, ELCO Group provides tailor-made microcomputer systems to dealers, consultants, and OEMs. 3Com Connected™ and CSA approved barebone systems are also available to customers who need flexible configuration and low cost. Whether you are looking for a full system or a single add-on card, the ELCO Group will be committed to you in service, delivery, and price.



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### LAVA RIDDLE

**Q:** Why did the Octopus cross the road?

**A:** To get to the bus.

**Congratulations to the winner  
of a Lava DSerial-PCI/LP!**

**Heather Evereth**  
Laser Action Plus  
Ocala, Florida

## 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
IEEE PC-Card	Single IEEE 1394 port, 400 Mbps, fits in PCMCIA slot

### Specialty Boards

PCI	8255-PIO	8255 PIO interface card
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