Options for ECR Polling over IP

A business case overview of polling options for Electronic Cash Registers over the Internet
July 2007

Introduction

Why ECR polling?

Electronic Cash Registers (ECRs) have an under-utilized capability: the ability to present their transaction information digitally, enabling software to record and analyze transaction details and summaries. This capability becomes increasingly important as businesses grow and develop multiple locations. Successful growth depends on coordinating and analyzing data from ECRs in the field to understand the big picture of a business.

The really expensive option: blindness

In most situations, the really expensive thing is not knowing what's going on out in the field, rather than the expense of getting that information.

When the true cost of not knowing immediately what is happening in stores is calculated, the case for ECR polling at some level is almost always justified. A business relies critically on sales data to analyze store performance or franchise commitments; information must be accurate and current.

With such strong reasons to know what's up, it is surprising that so few businesses keep a finger on the pulse of their stores with the regularity, accuracy, and immediacy that they should.

The problem is not that ECRs can't yield the necessary information; instead, the problem lies in connectivity. In many cases it seems like just too much trouble to set up the infrastructure to tap into ECRs directly and automatically.

Instead, chain operators are ready (and even happy) to have a store manager phone in the numbers at the end of the day. They then pray that the numbers are good and next manually enter them into whatever analysis tool they are using.

This approach makes no sense when software exists to poll ECRs and use that data to gain a clear view of what is happening across a chain of stores; polling software may even have come already with your ECR.

This white paper looks at infrastructure options for remote ECR polling.

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Options for ECR polling

Store operators and owners have available to them a number of methods of remotely collecting ECRs' transaction logs and sales data. They can:

- ❏ forget about remote polling altogether (an approach taken too often, considering the benefits available from centralized remote ECR polling);
- ❏ manage remote polling with no automation (such as printing off a cash register's sales information and then phoning the results to head office);
- ❏ use a little automation (such as printing off a cash register's sales information, then entering the results into a computer and e-mailing those to head office);
- ❏ use a little bit more automation (such as locally polling a cash register's sales information with a computer and transmitting those results to head office);
- ❏ use a dial-up connection, attaching a modem to the serial port of the ECR and connecting to a head office modem connected to a computer running polling software;
- ❏ use a **LAVA Ether-Serial Link** (or similar serial device server) attached to the serial port of an ECR, and transmit sales information over the Internet for head office processing;
- ❏ use an IP-enabled ECR to interface over the Internet to remote polling software;
- ❏ use a **LAVA HQ** unit at the head office to connect to **LAVA ST** units at stores; or
- ❏ use a **LAVA HQ+** unit at the head office to receive connections from **LAVA ST+** units at stores.

Each of these options has advantages and disadvantages relating to hardware cost, ease of installation, ease of use, reliability and accuracy of data, scalability, speed of polling, upgradeability, security, and monitoring benefits.

LAVA offers a variety of solutions for those wanting to implement ECR polling for dial-up modems. They are suited for settings ranging from a few stores to enterprises with thousands of locations, and for needs from basic ECR polling to remote device monitoring and management.

REMOTE POLLING OPTIONS AND BENEFITS Legend: ✪ = very good ✓ = ok ✳ = limited ✗ = poor, non-existent	hardware cost	ease of installation[1]	ease of use[2]	reliability & accuracy[3]	scalability[4]	speed of polling	upgradeability[5]	security[6]	monitoring benefits[7]
Forget about it	✪	✪	✪	✗	n/a	✗	✗	✗	✗
No automation (printed data phoned to head office)	✪	✪	✗	✗	✗	✗	✗	✗	✗
A little automation (manual data entry, e-mailed)	✪	✪	✗	✗	✗	✗	✗	✗	✗
A little bit more automation (local polling)	✓	✳	✳	✳	✳	✗	n/a	✓	✳
Dial-up polling (RS-232 modems over telephone lines)	✓	✳	✓	✪	✳	✳	✗	✓	✳
LAVA Ether-Serial Link (or similar) over IP	✓	✓	✓	✪	✪	✪	✗	✪	✓
IP-enabled ECR	✗	✓	✪	✪	✪	✪	✳	✪	✪
LAVA HQ-ST Link over IP	✓	✓	✪	✪	✪	✪	✪	✪	✪
LAVA HQ+ST+ Link over IP	✓	✪✪	✪✪	✪	✓	✪	✪	✪✪	✪

Notes:
1) Ease of installation relates to router/Internet configuration and the degree to which polling can be quickly configured
2) Ease of use relates to the degree of technical skill required by store employees
3) Reliability and accuracy are primarily concerned with whether polling data is sent on time and without errors or omissions (e.g. understated sales)
4) Scalability relates to the degree that the solution can be easily and cost-effectively deployed over a growing number of sites
5) Upgradeability measures the ease with which new firmware and software can be deployed or installed
6) Security relates to the insecurity involved in opening a gateway or router at a store, and the degree to which unauthorized connections can be established
7) Monitoring benefits are things such as real-time reporting on whether a store is online or reporting on uptime or unauthorized access attempts

LAVA Ether-Serial Links

LAVA Ether-Serial Links are one cost-effective way to get going with ECR polling. Whether you are implementing a retrofit to eliminate ECR polling over modems, or whether you are starting out to IP-enable serial ECRs that are not currently being remotely polled, the LAVA Ether-Serial can do the job.

Basic polling

LAVA Ether-Serial Links will IP-enable your serial-port equipped ECRs, making remote polling and ECR configuration a snap.

Operation is transparent to both the ECR and to the polling software, with the exception that the polling software will now contact an IP address instead of a modem's telephone number when collecting polling data from ECRs.

Small to medium deployments

Well suited to small and medium sized deployments of ECRs, the LAVA Ether-Serial Link will take an ECR's serial port output and direct it over IP to a remote IP address, either on the same local area network or over the Internet.

For users not needing status monitoring and the ability to remotely upgrade the firmware running on the LAVA device, the

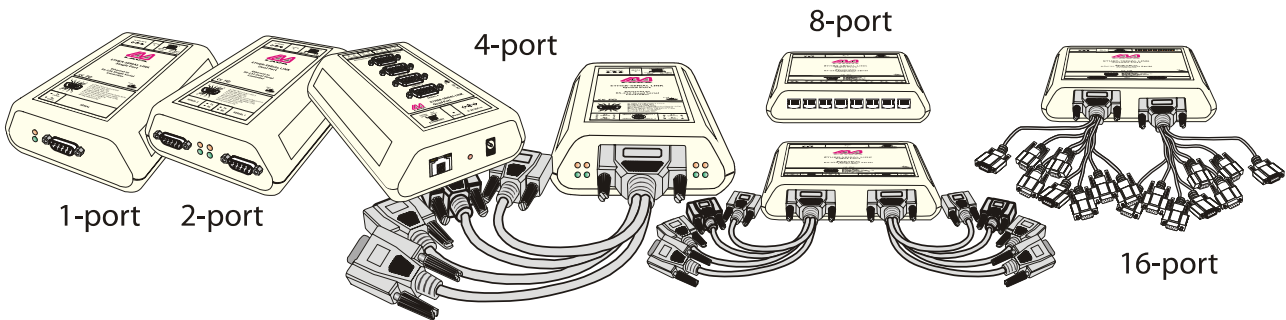LAVA Ether-Serial Link might be just the ticket.

When ease of setup and remote maintenance are high priorities, LAVA's HQ-ST Link and HQ+/ST+ Link are options suited to easy maintenance and deployment of large numbers of units.

Pricing

LAVA Ether-Serial Links are the most economically priced solution for IP-enabling dial-up ECRs.

Polling PC · modem · modem · ECR · Internet · Ether-Serial Link 1-port
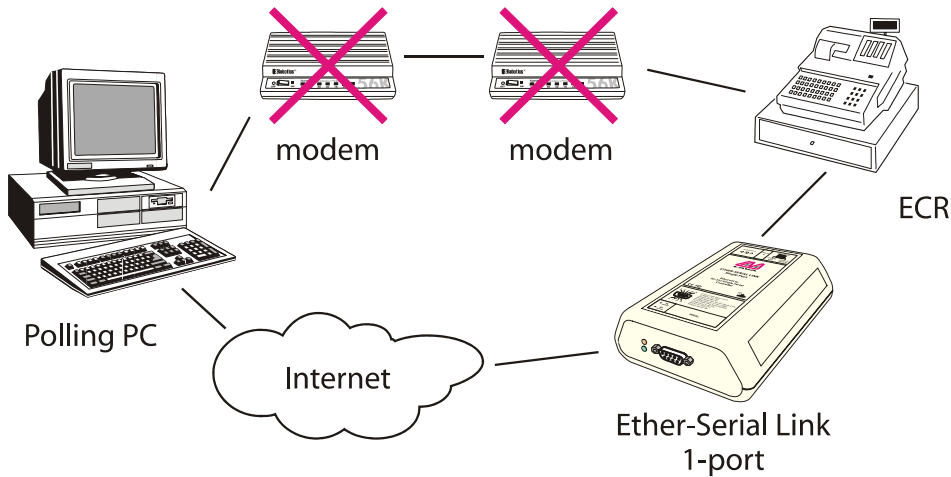
Ether-Serial Links: 1, 2, 4, 8, & 16 port versions

1-port · 2-port · 4-port · 8-port · 16-port

LAVA HQ-ST Links

The LAVA HQ-ST Link adds capabilities to the solution offered in the LAVA Ether-Serial Link.

Basic polling

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Large deployments

Intended for large deployments, the LAVA HQ-ST Link allows an organization to not only poll devices in the field, but to remotely upgrade firmware on ST units. When hundreds or thousands of units are in use, it becomes impractical or at least very expensive to send personnel on-site to upgrade or troubleshoot; the LAVA HQ-ST Link offers the capability of remotely upgrading firmware over the Internet.
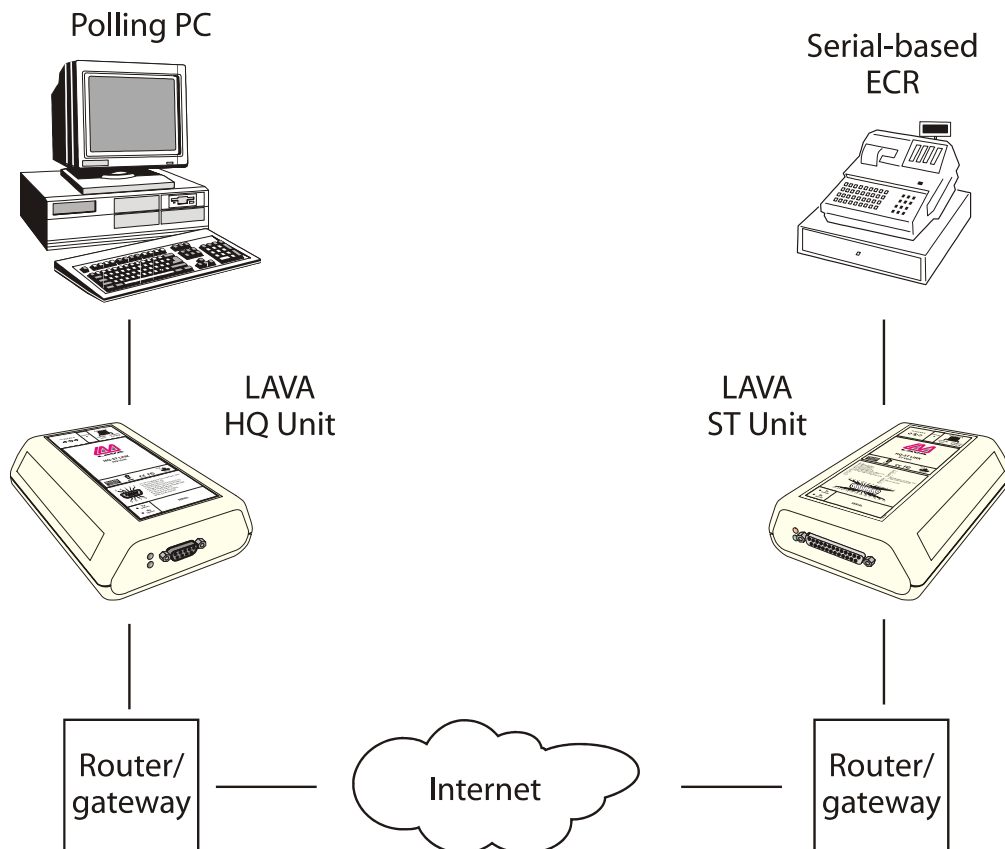
Security

The LAVA HQ-ST Link offers an enhanced level of security over a conventional serial device server. Connections between the store and the head office will only be established between units with correctly matched authentication codes.

Pricing

Pricing for the LAVA HQ-ST Link is mid-way between a solution using LAVA Ether-Serial Links and a solution using LAV HQ+ST+ Links. In addition, the HQ-ST upgrade solution for dial-up ECRs is far less expensive than buying ECRs with built-in IP capability.

Polling PC

Serial-based
ECR

LAVA
HQ Unit

LAVA
ST Unit

Router/
gateway

Internet

Router/
gateway

LAVA HQ+ST+ Links

The LAVA HQ+ST+ Link adds capabilities to the solutions offered by the LAVA Ether-Serial Link and the LAVA HQ-ST Link. The HQ+ST+ is designed to have simultaneously the highest levels of availability and security, and the lowest time requirement during installation of any IP-enabling hardware (or IP-enabled ECR, for that matter).

Basic polling

LAVA HQ+ST+ Links will IP-enable your serial-port equipped ECRs, making remote polling and ECR configuration a snap.

Operation is transparent to both the ECR and to the polling software, with the exception that the polling software will now contact an IP address instead of a modem's telephone number when collecting polling data from ECRs.

Deployments of virtually any size

The LAVA HQ+ST+ Link scales well to the needs of virtually any size business.

Unparalleled ease of installation

This is where the LAVA HQ+ST+ Link really shines. It is unique in the industry for its ability to be deployed *with no need to configure the port mapping parameters of the store-side router.*

This is not the case with any IP-based ECR or serial device server on the market.

The savings that result from this feature are huge: HQ+ST+ links can be deployed with very little networking expertise, and installers have no need to know anything about the router or ISP used by the site! One company estimates installation time will be reduced by two hours per store.

Security

The same design that makes the LAVA HQ+ST+ Link so easy to install also makes it the most secure link on the market. Because no store-side router port mapping is performed, there is no "hole" created in the store's firewall. At the head office site, the HQ unit needs just one port mapping, regardless of the number of store units connecting to it. All needs for network skill are centralized: an enormous benefit and cost savings when deploying devices to geographically wide-spread stores.

The LAVA HQ+ST+ Link, like the LAVA HT-ST Link, also offers the enhanced level of security over a conventional serial device server provided by having only authenticated connections between the store and the head office.

Management and monitoring

The LAVA HQ+ST+ Link provides another critical benefit to chain store operators: monitoring and management of remote ECRs. As well as sharing with the HQ-ST Link the ability to remotely update ST+ firmware in the field, the LAVA HQ+ST+ also provides status monitoring.

Now it is possible to instantly know when a store's ST+ unit is on or off, and back-end management software allows head office users to maintain a database of store information that can instantly issue alerts when an exception is noted on the HQ+ST+ network. If a store is off line during store hours, if a network connection comes online when it shouldn't, if an unauthorized store unit attempts to access the HQ+ unit, and so on, an alarm can be sent by SMS text message, e-mail, or pager.

Pricing

The HQ+ST+ Link has the highest hardware cost of the three ECR polling solutions LAVA offers, but that initial outlay in most cases will be immediately offset by the time saved in installation.

Polling PC

Serial-based
ECR

LAVA
HQ+ Unit

LAVA
ST+ Unit

Router/
gateway

Internet
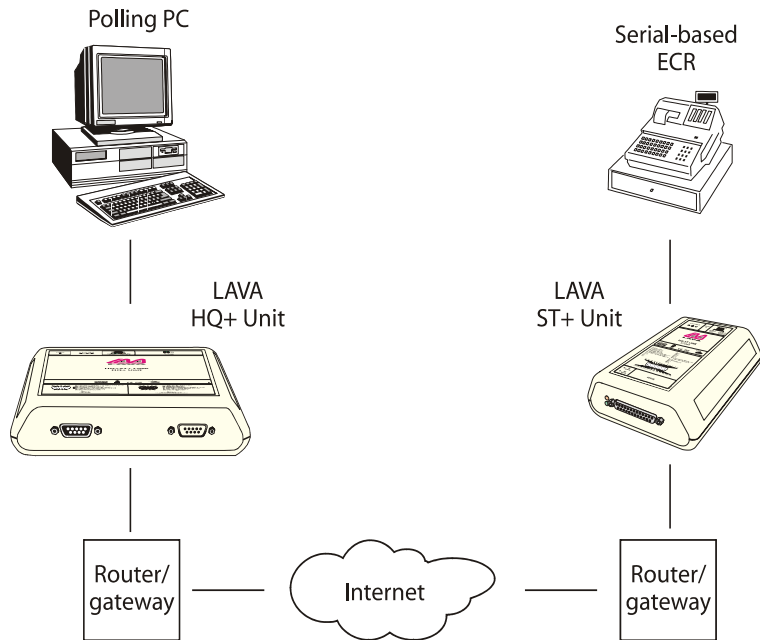
Router/
gateway

Router port mapping

Configuring a store location for Internet access to its ECR has always been complicated by the need to configure the gateway or router at the store to enable it for direct polling requests from the Internet to the appropriate location in the store's local area network (LAN). This is the case whether the polling scenario uses an IP-enabled ECR or whether a conventional serial device server is attached to an ECR that is serial-based and would have traditionally connected by modem to polling software at a remote location.

  Basically, an installer would need to know:

❏ the IP address to be used for the IP-enabling device (or IP-enabled ECR, as the case might be)
❏ whether IP addressing is static or dynamic
❏ any ISP requirements
❏ the port number assigned to the serial port of the IP-enabling device
❏ the IP address of the LAN's gateway or router
❏ the method of configuring the gateway or router
❏ password and log-in information for the router
❏ in addition, any ISP-specific requirements

  Once all this is done, there still remains the issue of security. Having a device at the store open to Internet access is in itself a potential security risk; now the ECR or serial device server will also need at least one log-in name and password. Of course, it would be prudent to have different security settings for each store, as well, introducing another management record-keeping headache.

  By the end of it all, inevitably, a lot of time has been spent configuring a store for remote polling, and the system is considerably less secure than before the whole process began.

Conclusion

The range of options available to store chains wishing to implement remote ECR polling is wide enough that users should be able to find an Internet polling option for their organization regardless of the number of store locations and devices to be polled.

**LAVA HQ+ST+
units**
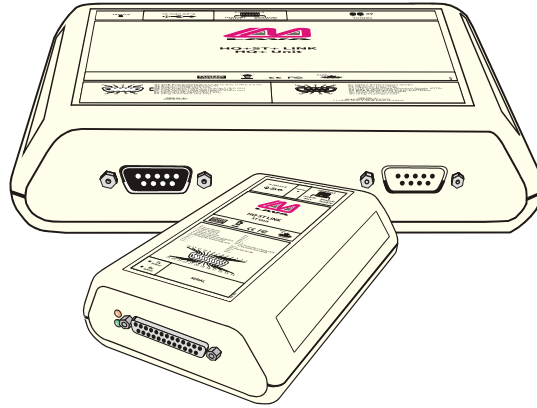
Fortunately, the market for remote polling is well-evolved and the cost of monitoring hardware is not a deterrent.

Any decision should of course take into account all the costs associated with deployment of a polling solution. In many cases, the greater portion of costs lies in the soft costs of installation and support, particularly when configuration requires the on-site visit of an installer/technician.

When these full costs are computed, the LAVA HQ+ST+ Link in many cases will be the best solution. Its ability to be dropped into use with no on-site configuration needed is powerful and unique.

Additionally, it is the most secure configuration possible. No router holes are created at the store, and no device can talk to the HQ+ and ST+ units except properly matched similar devices.

LAVA's other monitoring solutions are also cost-effective remote polling options, offering individual strengths for users contemplating limited or large deployments.