

Soft Automation News

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With RSSql, Plant Data and Enterprise Software Work as One



By Brandon Ekberg, RSSql Product Manager, Rockwell Software

It's only natural that much of today's information technology discussion focuses on databases. This is not to say that the debates over hardware, networks, and operating systems is over, but when you get right down to it, what good is the computer or the network without a place to store, share, and retrieve data? Most forward-looking manufacturing firms have recognized that the factory floor is a vital producer of data for running the rest of the company. Likewise, the plant floor needs to feed on data that is generated by other parts of the firm in order to be part of an end-to-end integrated enterprise.

In the manufacturing world, whether in process or discrete applications, people want and need a bi-directional link to bridge the gap between the control system and the enterprise database system. Until now, a "brick wall" has separated the plant floor and Information Systems departments. However, a secure, bi-directional link between these two environments now exists, allowing the manipulation of accurate and timely data. RSSql Version 2.0 is that link and provides guaranteed data delivery, including closing the loop between the PLC and

the database. This level of reliability has never before been obtained, and the result is a true control system-to-enterprise link.

With RSSql's bi-directional functionalities, the user can get validation back from the controller that the data is safe in the database.

Today there are many databases, or Enterprise-level transaction managers that are used everyday to link multiple databases together to act as one. They coordinate multiple actions and ensure the reliability of the entire "transaction" between the different databases. RSSql works in much the same way, except instead of linking multiple database systems, it links the controls systems to the database.

The bi-directional capabilities of RSSql Version 2.0 allow it to send data both up to the relational database and down to the plant floor. Take for example an automotive air-bag inflator manufacturer that needs to maintain complete documentation on every product it makes. RSSql sends the relational database a message telling it an assembly operation was performed. It also sends a message from the database back to the plant floor confirming that the inflator is Ok'd to move onto the next operation. Or in the case of BMW, RSSql is used as a "traffic cop" to store and retrieve in-process

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Bringing Together Leading Brands in Industrial Automation

auto bodies based upon the needs of the manufacturing scheduling system.

With RSSql's bi-directional functionalities, the user can get validation back from the controller that the data is safe in the database or to directly query the database for information and write results to the controller.



BMW uses RSSql to store and retrieve cars based on their scheduling system.

Another key strength of RSSql Version 2.0 is its scalable architecture. As your system grows, you still have the ease of use provided by a single intuitive interface into the entire system.

RSSql Version 2.0 is a distributed, scaleable application for use on a single PC or for distribution over an entire enterprise. Centralized configuration and operation help simplify administration even in highly complex system architectures, and additional computing resources can be added as the need for transaction processing power increases. The package has four primary components. The Graphical User Interface provides the means to link your shop floor to your database, while letting you configure and operate the RSSql Version 2.0 system. The real work, however, is done by three NT services.

The Transaction Manager, the brains of the system, executes transactions, while controlling the collection, manipulation and storage of data. The Control Connection is the interface to the process control system. RSSql's connections for RSLinx and RSView32 are tightly integrated with RSSql and RSLogix to provide the level of interoperability you expect. The Control Connection also supports connections to AdvanceDDE servers

and OPC servers. The Enterprise Connection is the interface to the relational database management system. RSSql includes Enterprise Connections for ODBC-compliant databases including Microsoft SQL Server, Sybase, Informix and Oracle. A new native connection to Oracle, called the Oracle Callable Interface (OCI) provides the fastest way to connect to the Oracle engine or its remote client connection, SQL*Net. It stores data and acts as a bi-directional connection to the database. While the Enterprise Connection services run on NT, RSSql can connect to databases on many operating systems including UNIX, OpenVMS and AS-400. The ODBC drivers provided by the database vendors can connect across TCP/IP-based networks to most remote databases.

Whether your solution requires a simple link to support logging of data to a database or a bi-directional super highway to tightly link the world of Control to the world of Data, RSSql's flexible architecture can meet your needs. **EN**

Additional functionality to be included in RSSql soon:

- **Support for OPC using generic OPC servers, RSView32, and RSLinx.**
- **Support for integrated RSWho for navigation of Rockwell Automation networks.**
- **Support for OLE-DB, the native interface for SQL Server 7.0.**
- **A new Verify function, which checks all transactions for validity and reports on possible configuration problems.**
- **A new Report function, which provides a detailed analysis of a RSSql configuration.**
- **A new Configuration checklist helps you get RSSql up and running for the first time.**

Product News

Rockwell Software ControlPak

An Integrated Software Solution for Development of Advanced PC-Based Control Applications



The Rockwell Software ControlPak™ solution is an integrated development and runtime environment that offers customizable tools for building advanced PC-based control systems.

ControlPak is also an important element

within the Rockwell Software SoftAutomation solutions strategy, focused on developing open integrated software solutions for control and integration with the rest of the enterprise.

ControlPak takes the best of Allen-Bradley control and Rockwell Software development tools and combined them with Microsoft technologies to create a complete open systems architecture for PC-based control.

Some of ControlPak's features include:

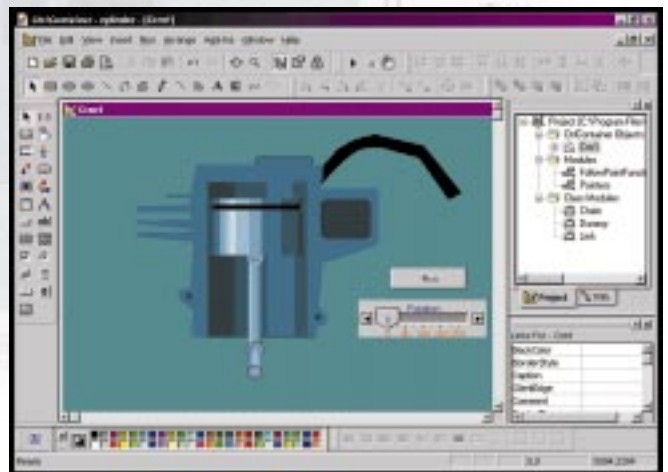
Soft Control Engine: This SoftLogix control engine runs on Windows NT(r), and is upwardly compatible with I/O, networks and application software developed for Allen-Bradley controllers.

Network Support and Open Connectivity Options: Native ControlNet(tm) and DeviceNet(tm) I/O systems support provide users with a greater selection of flexible I/O devices and superior I/O update speed.

Control Language Editors: RSLogix SL5, a new control language editor for the SoftLogix 5, combines in one package: advanced ladder logic, IEC-compatible structured text and sequential function chart (SFC) language editing tools.

Open Systems Technologies and CtrlContainer: ControlPak is built using open system technologies from Microsoft, including COM™, ActiveX controls and Visual Basic for Applications (VBA).

EN



RSLogix 5000 Programming Software

To Improve Programming, Support, and Diagnostic Capabilities of the ControlLogix System

RSLogix 5000 is a Windows NT and Windows 95/98-based programming software package for the Logix5000 processors. The RSLogix 5000 programming package is the next addition to the RSLogix family of 32-bit programming

packages designed for Microsoft's 32-bit operating systems. RSLogix 5000 supports the Allen-Bradley ControlLogix architecture and Logix5550 processor. Based on IEC1131-3 standards, RSLogix 5000 includes advanced controller features



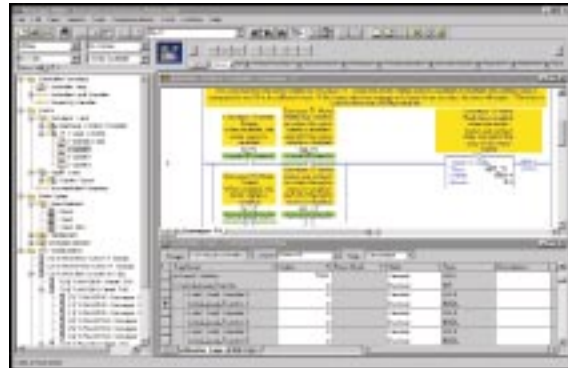
such as custom user-defined structures and symbolic addressing to provide the flexibility needed for complex applications. The software also includes motion tools which provide a highly integrated motion and logic solution.

RSLogix 5000 can also re-use existing PLC-5 and SLC 500 projects.

The primary features included in this release include: program upload merge and application database, forcing of I/O, operand

comment creation, intelligent search and replace, CSV database import/export and programmatic access to the processor clock.

EN



RSView32 Add-On Architecture (AOA)

Expands Functionality and Interoperability



RSView32 has now been enhanced with the introduction of Add-On Architecture (AOA). The AOA features expand the visualization capabilities of RSView32 by embedding TrendX, RecipePro, and

statistical process control (SPC) features directly

into the software without altering any core components of the HMI, allowing customers to use these features only when they are required for an application.

With AOA technology, powerful features, enhancements and extensions can be quickly deployed. Some of these features include:

The RSView32 TrendX add-on, based on AOA architecture, is an ActiveX control for monitoring real-time and historical process data. TrendX also provides a strip chart recorder display as it collects data. With TrendX, users can plot variables against each other (x-y plotting), add or delete pens during runtime and change pen colors, markers, and axis scaling during runtime.

The RSView32 Recipe Pro add-on, also based on the AOA architecture, provides enhanced recipe management features. Users can create multiple recipe project files in each RSView32

project and configure multiple recipe files, each containing sets of RSView32 tags and sets of data.

The Statistical Process Control (SPC) add-on extends the functionality of RSView32 by providing real-time SPC analysis. With RSView32 SPC, users can configure multiple SPC products each with its own characteristics. EN



For more information on these or other RSI products, visit www.software.rockwell.com.

ViewPoints

Open Systems in Software

When we ask software users around the world if open systems are important to them, the answer is always yes, but their definitions of open differ a lot, from "plug and play" to a strict adherence to a standard. Opinions vary within the enterprise as well. A plant supervisor might define it differently compared with the vice president of Marketing.

To really understand openness from a software perspective, you need to take a look at the underlying technology enablers that create the environment for open applications and tools.

A few years ago, Microsoft began developing open products – products that exposed their properties to each other. The company's earliest "open" development began with OLE and ActiveX controls. ActiveX became a standard for integrated technologies that enables software components, written in different languages, to work together in networked environments. ActiveX helped make it easier to integrate a system by using different components from different vendors. Since then, we've seen several additional enablers for open systems. The Component Object Model and the distributed version allow for better sharing of resources in a distributed computing environment.



The OLE for Process Control (OPC) Foundation, a group of the industry's leading manufacturing software suppliers, developed a set of specifications designed to provide seamless, open, enterprise-wide communications between systems and devices, from plant floor to MIS and beyond. The widespread adoption of the OPC specification will reduce the cost and quality hurdles of multiple proprietary servers, drivers and interfaces needed in the past.

Instead of applying software that only allows for connection to proprietary databases, many users are utilizing tools that allow connections to any database. Rockwell Software RSSql, for instance, allows a user to integrate his or her Human Machine Interface (HMI) software with virtually any ODBC-compliant database, allowing for more flexibility and ease of use.



Visual Basic for Applications (VBA), Microsoft's integrated development environment, allows not only for customization of the off-the-shelf application you're using, but also better integration with other software using VBA. Rockwell Software RSView32 was the first industrial Human Machine Interface to integrate VBA, which provided its users with much more flexibility and interoperability. ControlPak also includes a feature which allows a graphical interface to be programmed and customized using VBA providing a sense of "openness" for that user.

Several factors go into choosing the right software for your unique needs: performance, ease of use, life cycle cost, flexibility, reliability, ability to upgrade. All of these would describe "open" in its finest sense, and as the customers demand more, this presents that customer with the ability to extend their reach – and develop customized software solutions. EN

Applications

Forged in Copper

The Plant Floor/Enterprise Link

Achieving an effective plant floor-to-enterprise computer link has long been regarded as something of a 'Holy Grail' in the world of industrial automation. Townsville-based copper refinery, Copper Refineries Limited (CRL), has succeeded in implementing such a link, using Rockwell Software's powerful RSSql industrial transaction manager software package.

The refinery is part of the MIM Holdings Group, Australia's largest copper producer. The plant refines anode copper stock sourced from the giant Mount Isa mine, some 800 kilometres inland. Electrolysis processes are used in the refinery's tankhouse to purify the anode stock, producing copper 'cathode' – 8 mm thick, one metre square sheets of purified copper.

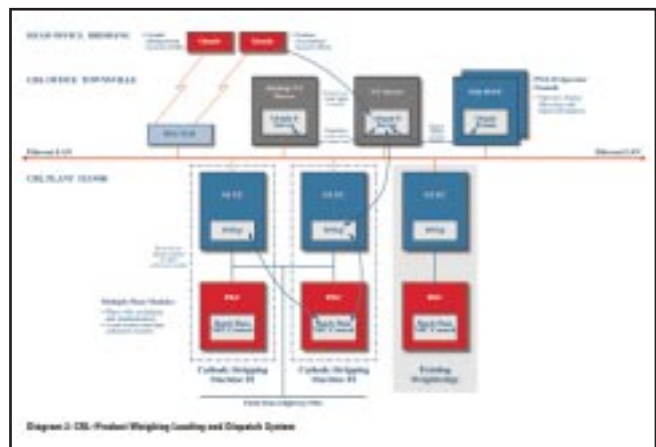
The data link is an integral part of the plant's new Oracle-based Product Weighing, Loading and Dispatch (PWLD) system, which was designed and implemented by Brisbane-based Rockwell Automation Systems Integrator, VRT Systems. The PWLD system permits two-way data transfer between the plant's Oracle-based supervisory control level and the PLC controllers at the tankhouse floor. It also transfers real-time production and copper inventory data from the refinery plant floor to MIM's Brisbane head-office, over 1,000 kilometres south of the refinery.

The PWLD system is part of a A\$61 million total plant upgrade – the tank house expansion project – that has gained a thirty-five per cent improvement in plant production capacity with only a 10 per cent increase in total refinery's tankhouse size. This has been achieved by incorporating new generation machinery, dual production streams and a complete rework of process control and batch automation.

The original 20 year old production process provided a purely manual approach to filling production orders. Its single production stream involved laborious, multiple forklift transfers of raw anode and purified cathode sheets about the CRL tankhouse.

A single manual weigh station provided the sole facility to determine certified weights of the final cathode 'bundles'. This station was in turn linked to a legacy generation computer running a custom Fortran language routine, providing a basic data link to the Oracle-based Product Accounting System (PAS) and Freight Management Systems (FMS) applications at MIM's head-office.

The revamped system provides two parallel cathode production streams, each with in-line cathode stripper and certified weigher. The plant's four basic production processes – the raw anode preparation line, the anode scrap line and the two cathode stripping and bundling lines – are fully batch automated using Allen-Bradley PLC-5 controllers.



Unlike its predecessor, the new scheme involves minimal forklift transfers. Cathode is conveyor transferred from each stripper, stacked to the required pre-set bundle weight, then certified weighed – all automatically within the production stream and without manual forklift transfers.

The 'in-line' weighing of copper cathode and anode demanded a new approach to the refinery data collection scheme and the refinery-to-enterprise computer link.

With 'live' batch data available from each line's PLC-5 controller, it was apparent that real-time batch control and monitoring could be achieved – at both the PWLD and head-office computing levels.

As the PAS and FMS programs were Oracle-based applications, Oracle software was selected to create the plant operator data interface. A DEC NT server running Oracle 8 Server was chosen as the master PWLD server. This is connected via a plant-wide Ethernet LAN to the PWLD operator console – a client PC running 'Oracle Forms'.

At the tankhouse plant floor level, each of the refinery's four production process lines is equipped with an Allen-Bradley PLC-5 controller and a Rockwell Automation 6180 industrial computer. Local operator control is achieved at each line via a PanelView 1200E operator interface. All PLCs, PCs and PanelView stations are interconnected via the refinery's plant-wide DH+ peer-to-peer data link.

RSSql Version 2 was chosen to provide the critical link between the real-time plant floor PLC-5 data and the supervisory Oracle application software running in the PWLD server.

The powerful industrial transaction manager can connect to any ODBC-compliant data base. In addition, RSSql Version 2 features a new native connection to Oracle, called Oracle Callable Interface (OCI), providing the fastest connection to an Oracle engine.

Weighing and batch data is transferred from each machine's PLC and collected by the RSSql on-board the machine's industrial PC. RSSql also controls the weighing and dispatch cycle, by setting and resetting specific batch control flags in the PLC according to batch instructions set at the PWLD operator console.

In the refinery's reworked PWLD scheme, there is little scope for unplanned network or computer failures. An important feature of VRT Systems' PWLD design is the provision of various levels of hardware and software redundancy.

At the Oracle server level, a backup PC is provided with Oracle replication duplicating the Oracle database. At the tankhouse control level, each machine can operate as an automation 'island', independently processing batch data to the Oracle database.

In the event of a LAN failure, each machine's PLC can store data for up to eight hours, and batch details can be entered locally. When the LAN is re-established, RSSql will automatically retrieve the data from the PLC and transfer it to Oracle.

In the unlikely event of a machine PC failure, RSSql permits operation of the failed machine from any of the remaining industrial PCs. All five industrial PCs has been configured with the RSSql transactions for the entire plant – by simply enabling the RSSql transactions of the failed machine at any of the four remaining 'live' PCs, the failed system may be quickly brought back on line.

The CRL tankhouse expansion has provided the plant enormous benefits in production flexibility. From the PWLD operator console, batch requirements can be scheduled well in advance and Sworn Weight Certificates produced by the PWLD operator as product bundles leave the line.

But it is the real-time nature of the RSSql link that, according to VRT Systems' engineering manager Daryl Kucks, delights the CRL production team. "Really, what we've achieved here is a real-time interface", says Kucks. "The PWLD console operator can see bundles produced as they come off the certified weighers. He can actually sit there and watch his order being made up – right at the enterprise computing level." **EN**

To read more application stories, visit:
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World Events and Seminars

2nd. Annual Soft Automation Awards Contest

Showcase your application and WIN some outstanding prizes.

Look for application forms and rules & regulations on the Rockwell Software homepage, or e-mail a request to awards@software.rockwell.com

What's Happening in...

Latin America:

Software Blitzes: These are one-day seminars for anyone in the industry and include product presentations, lunch with a Microsoft guest speaker, and hands-on-lab sessions. These seminars are free of charge. For more information contact your local Rockwell Automation / Allen Bradley Distributor or Henry Petersen at (787) 834-0161 or henry.petersen@software.rockwell.com

Upcoming Schedule for Software Blitzes:

Apr.	6 - 9	Chile (Tentative)
Apr.	19 - 23	Mexico
May	17 - 18	Ecuador
May	20 - 21	Peru

North America:

IMS EXPO 1999: International Manufacturing Software EXPO Orlando, Florida. April 26-29. For more information visit www.isa.org/imsexpo/index.html

Europe:

Portugal: Endiel Trade Show- This Bi-annual trade show focuses on the electric, electronic, and automation industries. Date: May 26-30.

Spain: In the months of April or May, offices throughout Spain will be hosting presentations for RSView32 and RSView32 Active Display System focusing on the new features of this product.

European DNA/RNA Events

Rockwell Automation is teaming with Microsoft to stage events that showcase DNA/RNA for manufacturing. The events being held across Europe will include a Microsoft presentation called "The Digital Nervous System for the Industry." Rockwell Software will highlight its RNA for manufacturing and provide a presentation on SAP connectivity with a customer on hand to provide a real-life case of a DNA application.

Please direct comments or contributions regarding
Soft Automation Newsletter to:
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For more information about any of these events
contact your local Allen-Bradley/Rockwell
Automation office.

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