

APPENDIX P

Rockwell Automation System Information

ARC WHITE PAPER

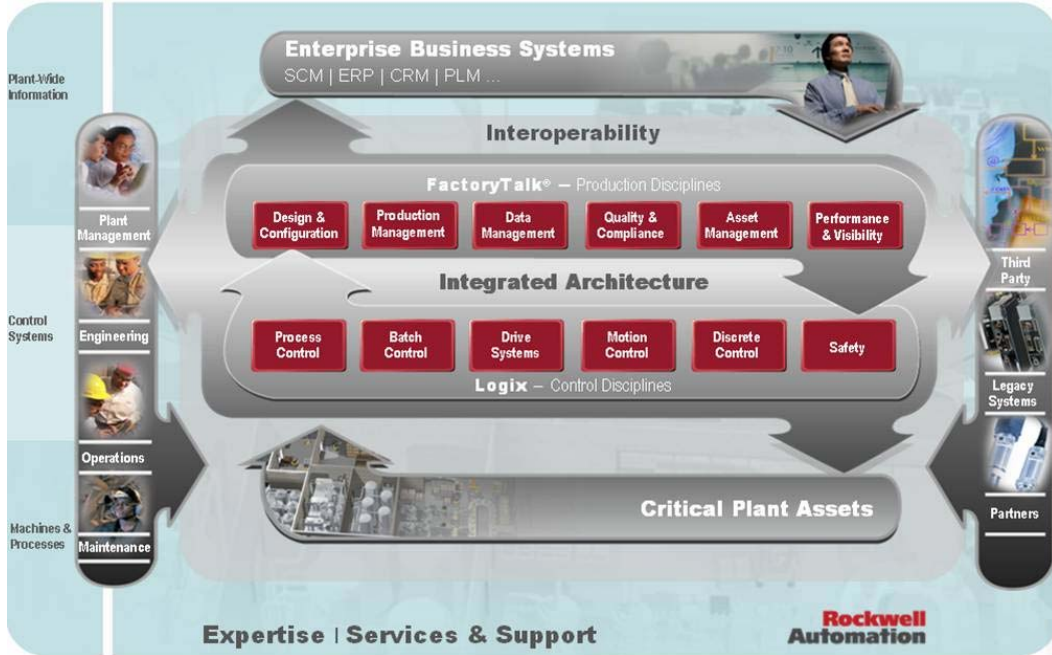
By ARC Advisory Group

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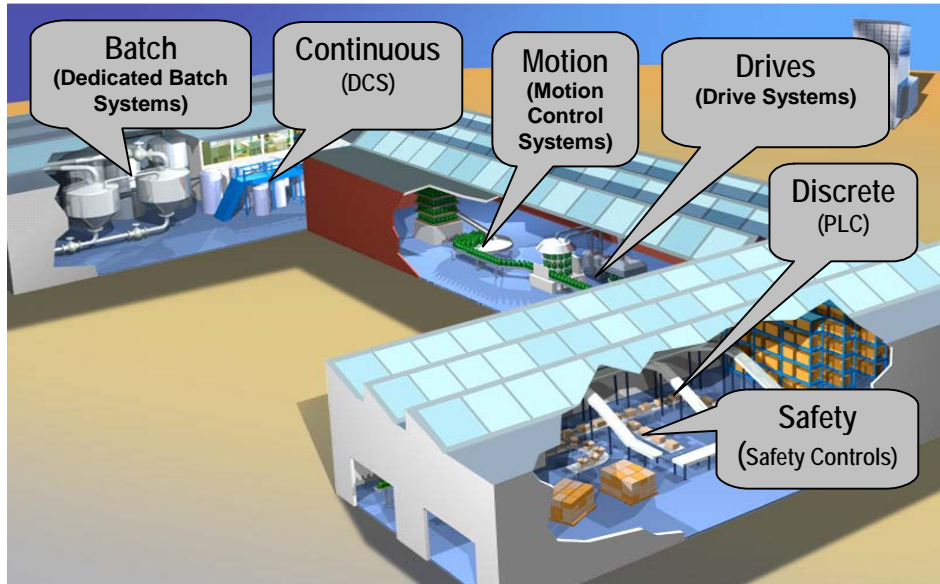
Rockwell Automation Process Industry Strategies

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Rockwell Automation's Integrated Architecture Conforms to a CPAS Framework



Integrated Architecture Unifies Islands of Control, Process, Logic, Motion, Safety & Drive Control

Executive Overview

Rockwell Automation has many strengths that make it a formidable competitor in the world of process automation. The company's foundations in discrete automation and process batch applications have resulted in an automation infrastructure that addresses the full scope of control domains, from process control (continuous and batch), intelligent motion control, drives premier integration, sequential discrete control applications (packaging and material handling) and safety.

By leveraging its worldwide installed base with their Integrated Architecture process automation solution, Rockwell Automation has been making many inroads in key process industry applications.

Rockwell Automation has made the process industries a top strategic priority. By leveraging its worldwide installed base with their Integrated Architecture process automation solution, Rockwell Automation has been making many inroads in key process industry applications. Major process industry end users are using Rockwell Automation's process automation solutions.

The company developed its process automation architecture by leveraging knowledge acquired through the application of its many products that have been installed in process applications for years. You would be hard pressed to walk into any process plant in the world and not find some piece of Rockwell Automation hardware or software. The keystone in the company's strategy is that Rockwell Automation is building upon these components to provide the functionality needed for true process control, which in the past had been the domain of DCS suppliers.

While Rockwell Automation is increasing its recognition as a process automation hardware and software supplier, the company is also expanding its capability as a solutions provider in terms of turnkey applications, installation services, and post-sales services, which increase system and plant performance and provide users with a true business value proposition for automation. It must do all of this while balancing its strong relationship with preferred systems integrator partners. Rockwell Automation is also forming alliances where it has gaps in its process automation offerings, such as process field instrumentation. The company is doing this through alliance programs with suppliers such as Endress+Hauser.

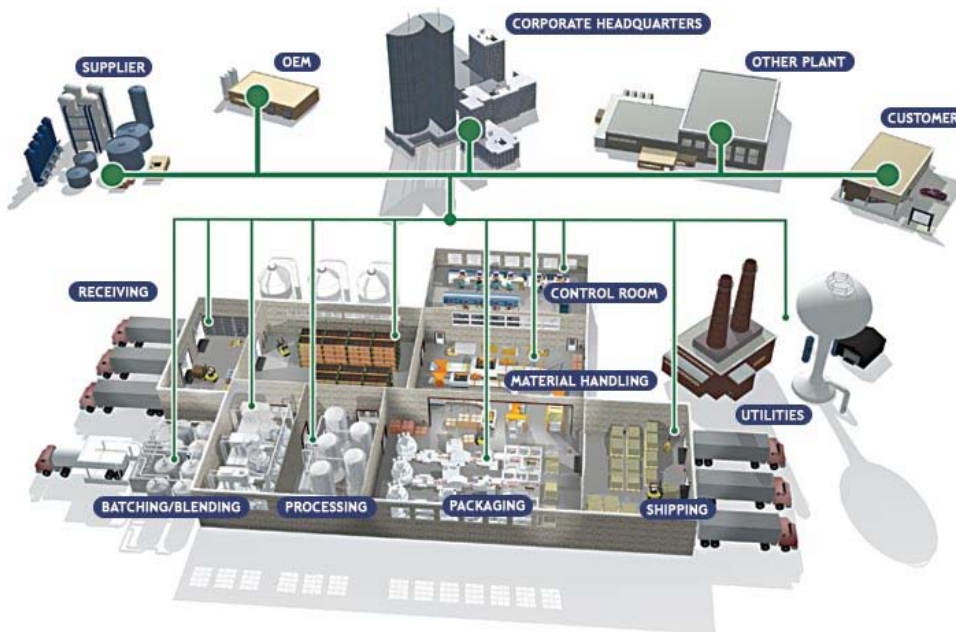
Rockwell Automation has a long history in Process Industries

For many years now, the worlds of process and discrete automation have been converging. ARC's Collaborative Process Automation System (CPAS) vision illustrates a single, consistent view into all domains of plant control and provides a common framework that allows for optimization of the entire manufacturing enterprise.

Rockwell Automation has turned this vision into a reality. Their platform merges discrete (PLC) and process (DCS) control functionality in one system with a unified framework for interfacing to manufacturing enterprise

systems. Rockwell Automation is certainly no newcomer when it comes to the process industries. The company has a well-established presence in hybrid industries such as food and beverage, pharmaceuticals, and pulp and paper.

The process and hybrid industries have offered a substantial growth opportunity for suppliers in the past several years, and the overall process automation



Rockwell Automation's Goal is to Integrate Process Automation with All Other Areas of the Plant or Manufacturing Facility

marketplace continues to be in an expansion mode that will continue for several years to come. The market continues to be buoyed by infrastructural and grass roots development in China, India, and other developing economies, combined with users in the Americas and Europe that are making significant investments in upgrading equipment. Rockwell Automation, who has always had a strong presence in the batch market, has made the continuous process industries, including oil and gas, power, chemicals, cement, metals, pulp & paper, and water and wastewater treatment, a top strategic priority within its organization.

Rockwell Automation's History in Process Automation

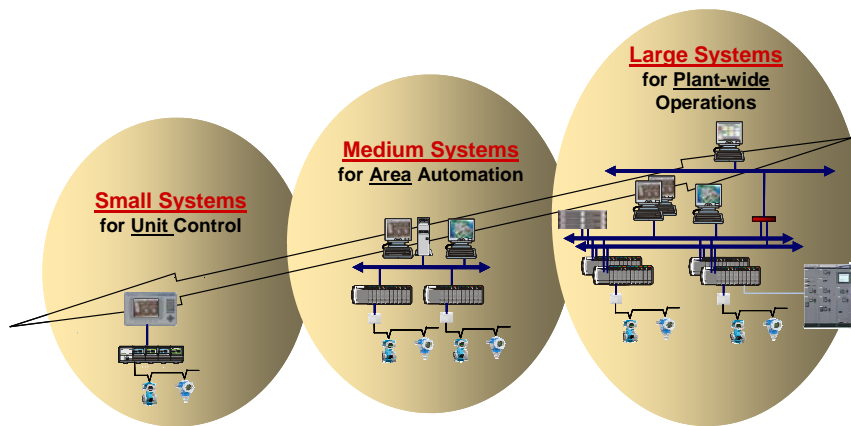
With the introduction of its own CPAS in the form of Integrated Architecture, Rockwell Automation has a platform that can serve the process industries.

For years, end users have also implemented process solutions with both the PLC-5 and Rockwell Automation's Reliance AutoMax control systems. In the '90s, Rockwell Automation introduced the ProcessLogix system, which

was the product of an alliance with Honeywell that simultaneously resulted in Honeywell's PlantScape system. ProcessLogix addressed the combined needs of the batch and hybrid industries that a traditional DCS did not meet.

Rockwell Automation viewed ProcessLogix as a crucial step in embracing the overall process automation marketplace. Rockwell Automation realized that it had to create its own offering,

with an integrated HMI, controller, and I/O architecture. The company also wanted users to benefit from the openness of its architecture, which was limited with ProcessLogix. Rockwell Automation has a history of supporting products long after their lifecycle and will continue to support ProcessLogix, but it is no longer the offering for new process automation applications.



Integrated Architecture is Scalable from Small Unit Applications to Distributed Plantwide Control

Rockwell Automation Builds Its Own Process Automation System with Integrated Architecture

Rockwell Automation had success with ProcessLogix. In 2004, Rockwell Automation increased its focus on the process industries with its own process automation system offering based on Integrated Architecture. Rockwell Automation realized that they already had many of the components needed to develop a process solution – they just had to pull them all together and make enhancements to them to create the functionality necessary for a PAS. The company laid out a plan for significant enhancements to its process

offering, and hired more development engineers, expanded its network of systems experts and vertical domain experts, and added experienced automation consultants. Rockwell Automation formed a leadership team specifically for process automation, with key leadership positions established in each core business.

During the time Rockwell Automation was promoting ProcessLogix, they were developing additional process functionality into Integrated Architecture. With this critical mass in process automation capability, it was now time for the next phase in Rockwell Automation's process automation

Many of these new process developments put into the Integrated Architecture system were done so with the input of the Rockwell Automation Process Solutions User Group (PSUG), which is made up of a large number of key process customers.

evolution. Rockwell Automation knew that it needed to develop a process automation solution that leveraged its customer base of robust industrial control hardware with its growing lineup of software offerings. Many of these new process developments put into the Integrated Architecture system were done so with the input of the Rockwell Automation Process Solutions User Group (PSUG), which is made up of a large number of key process customers.

The primary challenge Rockwell Automation faces is communicating its capabilities in process automation to the end user community and building a message that resonates with process automation users that are new to Rockwell Automation as well as those that have been using the company for their process automation needs for years. Rockwell Automation's presence in many areas of process plants gives it an installed base it can significantly leverage.

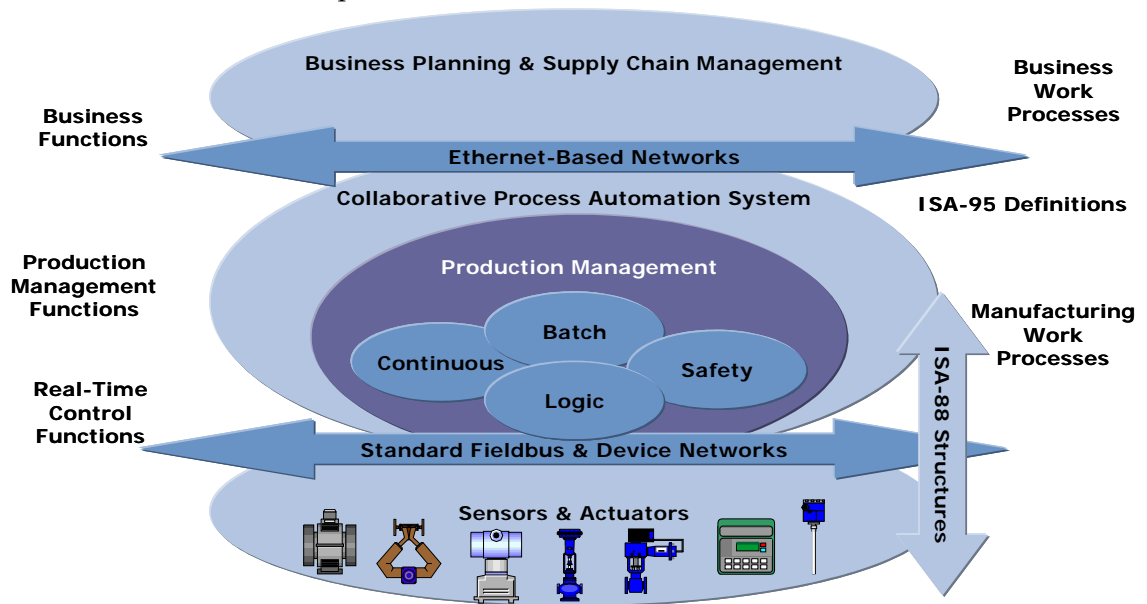
Mapping Integrated Architecture to ARC CPAS Model

ARC has a model that it considers as a benchmark for process automation system functionality both today and moving forward. This view is encapsulated in our Collaborative Process Automation System (CPAS) framework. Integrated Architecture conforms to ARC's CPAS model in key areas, from engineering and configuration, to a common hardware platform to presenting information in context to the right people at the right time from any point within the system.

The culmination of the functional enhancements and new developments for process automation is the Integrated Architecture. Unlike ProcessLogix, Integrated Architecture is a system built from the ground up by Rockwell Automation that incorporates a unified HMI, control platform, and engineering tools.

The two primary layers of Integrated Architecture for process automation are the Logix control platform and the FactoryTalk suite of applications. The Logix platform provides a unified and common infrastructure that can address continuous applications as well as traditional batch and discrete applications. FactoryTalk encapsulates the production management environment and includes other applications such as batch control, batch management, asset management, and integration with enterprise resource planning (ERP) systems. Integrated Architecture incorporates standards such as IEC 61131-3 programming, EDDL, FDT/DTM, Foundation Fieldbus, HART, EtherNet/IP, DeviceNet, and ControlNet. ISA-88 hierarchies are now implemented in the system, as are structural and transactional elements of the ISA-95 standard. Security is addressed in conformance with the ISA-99 standard.

Rockwell Automation is focusing on its core strengths that already exist in process, hybrid, and discrete industries. The goal is to supply users with a process automation system that suits their needs in terms of scalability, ease of use, and a plantwide view of control. Current customers tend to use



ARC's CPAS Functional View

small to medium size systems, according to ARC's definition. Integrated Architecture is capable of meeting those requirements as well as the requirements for large systems.

Individual Production Disciplines with a Common Data Environment

Rockwell Automation's plant-wide information software and manufacturing execution system (MES) offerings are deployed in a service-oriented architecture (SOA), and bring together the company's software product offerings into a single integrated suite known as the FactoryTalk Integrated

Production & Performance Suite.

Similar to how Rockwell Automation discusses its automation layers as supporting multiple control disciplines on a single platform, Rockwell Automation discusses supporting multiple production disciplines within the FactoryTalk suite. These disciplines provide relevant real-time



FactoryTalk Provides a Unified Framework for Process Automation from Design and Configuration to Production and Asset Management

information from the automation layer and deliver it to the people and systems that need it, when they need it, from any point in the system, including information exchanged with enterprise systems (e.g. ERP systems). This is what ARC refers to as "information provided in context" in our CPAS model. The strategy for FactoryTalk is to provide an integrated plant-wide information suite that extends and leverages the Integrated Architecture and delivers interoperability and open connectivity via the use of standards-based data models.

The FactoryTalk integrated production management and performance suite is broken into six primary production disciplines: Design and Configuration, Production Management, Data Management, Performance and Visibility, Quality and Compliance, and Asset Management. Rockwell Automation offers premier integration to their installed base by seamlessly

connecting their FactoryTalk production platform to their Logix multi-disciplined control platform, enabling end to end production control and use of information.

Integrated Architecture provides for a common system infrastructure. The latest version of Integrated Architecture adds a common security infrastructure for applications that provides central administration of end user access control and centralized management of licenses.

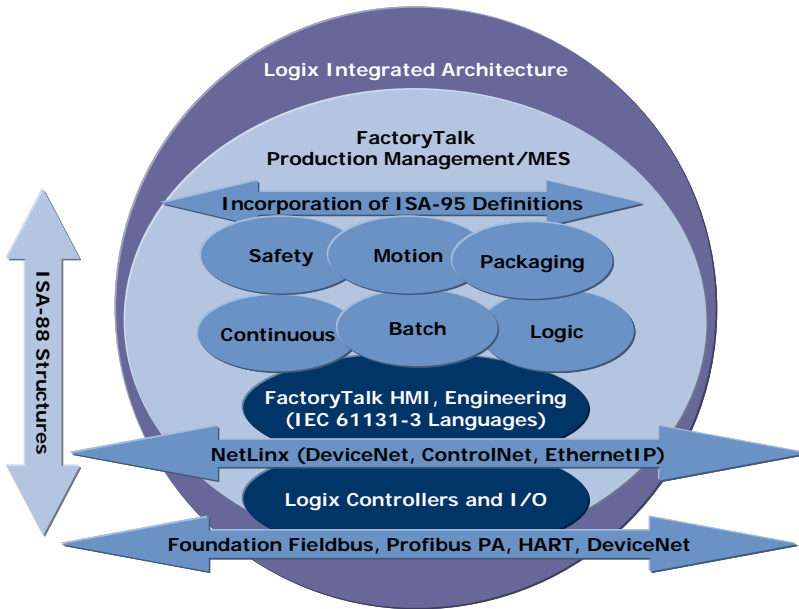
Integrated Architecture Provides a Unified Engineering & Configuration Environment

A unified engineering environment is a core CPAS requirement. Design and configuration for Integrated Architecture in process applications is done through an integrated environment for creating, modeling, and programming production processes. Integrated Architecture provides automation control programming, allows users to set up and propagate re-

usable equipment, order and define products, and allows for process development, simulation, and deployment. Integrated Architecture provides a consistent look and feel for all control strategy development tasks as well as a consistent environment for developing and testing control applications.

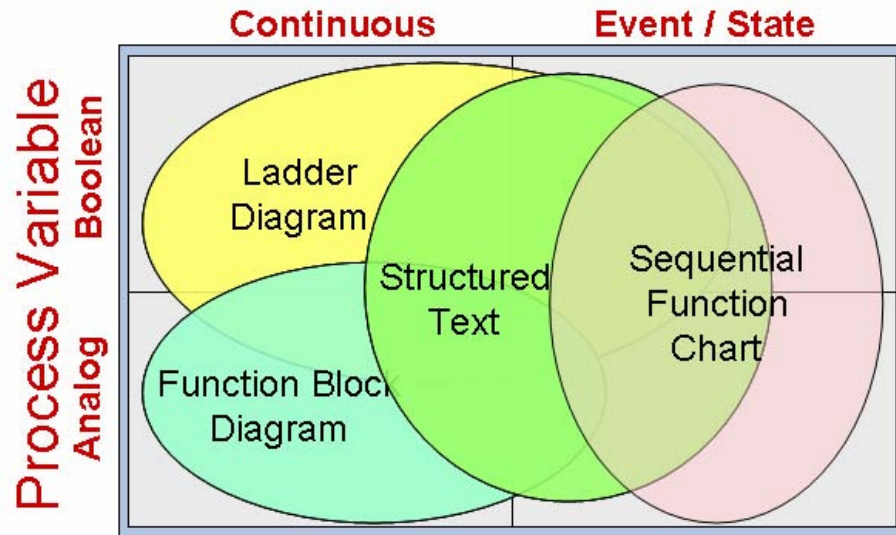
Integrated Architecture configuration environment covers process control, motion, safety, discrete control, and drives applications, enabling information to be provided in context to the users or other applications in the environment.

Rockwell Automation’s configuration supports the IEC 61131-3 languages, and they are integrated with each other, enabling function blocks to call ladder routines, sequential function charts (SFCs), structured text, and so on. In ARC’s view, this is a unique ability for Rockwell Automation.



Integrated Architecture Provides a Common Control Environment and Supports Standards

Smart instrumentation/process device integration and intelligent condition monitoring are supported in the engineering environment. More details on these functions are covered later in this report.



Rockwell Automation's Integrated Support of IEC 6-1131-3 Languages Provides a Competitive Advantage

Integrated Architecture Provides Single HMI Environment

A common HMI environment where users have a consistent interface to data, when and where they need it, from any point in the system is another key CPAS requirement. Integrated Architecture has a common HMI environment, which is integrated with the Logix control layer.

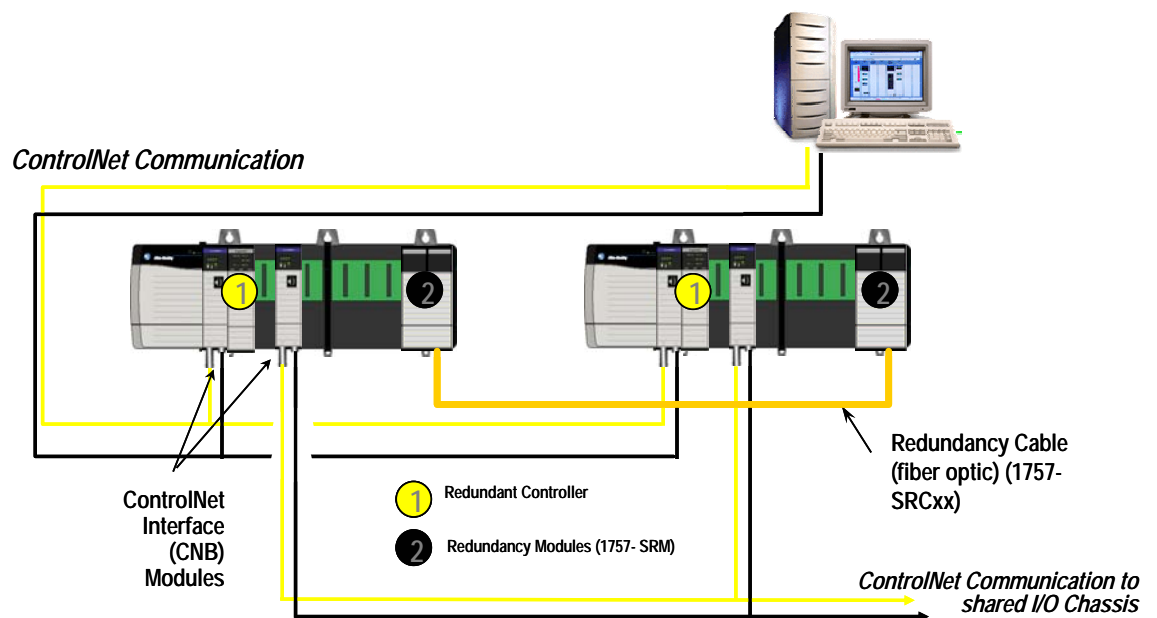
Integrated Architecture Provides Single Open Hardware Environment for Controllers & I/O

The CPAS model specifies a common environment for control hardware due to its ability to reduce integration costs and provide better scalability both up and down. Integrated Architecture can scale from a single unit controller, associated I/O, and workstation up to a system with tens of thousands of I/O points, multiple servers, and multiple controllers.

One of Rockwell Automation's advantages is that it has been making control hardware for use in harsh industrial environments for years. Logix I/O and controllers are highly durable and can be mounted in harsh environments outside the control room. Another key advantage is that many

Rockwell Automation systems are already installed today; making it easy to find personnel trained to program and maintain Rockwell Automation systems.

The recent creation and adoption of new performance based safety standards such as IEC 61508 and IEC 61511 has led to the need for solutions to meet these new non-prescriptive requirements. Adoption of the standards has required quantifying the “risk” and reducing it to an acceptable level. The risk requirement is quantified as one of four Safety Integrity Levels (SILs). Process safety standards such as IEC 61511 and its predecessor ANSI/ISA-84 identify layers of protection to mitigate the risk.



Integrated Architecture Controllers Support Full Redundancy & Avoid Single Point of Failure

One way to mitigate risk is through use of an independent Safety Instrumented System (SIS). To meet these new requirements, Rockwell Automation had TÜV certify ControlLogix for use in up to SIL 2 applications. Rockwell Automation has developed a SIL 3-rated 1002 offering called GuardLogix. The company provides a redundant version of ControlLogix for implementing high availability, which can be used in fault tolerant applications of the SIL 2 ControlLogix and I/O. These same High Availability and SIL rated offerings are available for the ControlLogix when it is used as a basic process control system (BPCS).

The controllers support full redundancy, avoiding a single point of failure. No extra programming is required for redundancy, which minimizes engi-

neering effort. Automatic program synchronization eliminates the need to maintain separate programs for the primary and secondary controllers. Integrated Architecture controllers and I/O also offer high availability, supporting runtime edits for tags and logic. One unique feature that benefits users of highly available systems is the ability to upgrade the controller firmware and control strategies while a system is running.

EtherNet/IP Provides Common Control Network

At the heart of CPAS is a unified communications framework that provides a common fault-tolerant backbone and delivers synchronized information among CPAS applications in a plug-and-play environment and manufacturing management applications.

EtherNet/IP is the industrial Ethernet solution from the Open Device Vendors Association (ODVA), an industrial consortium also known for its CIP networks DeviceNet, ControlNet (through a joint technology agreement with ControlNet International), and now the new CompoNet. The common thread of all four networks is the “Common Industrial Protocol” (CIP). CIP is a command set for industrial information exchange that grew out of a proprietary protocol used in the past by Allen-Bradley (now Rockwell Automation) controllers. The advantage of the CIP model is that the same command set is common to all CIP networks, enabling applications to cross networks without the need to translate protocols.

Since the first EtherNet/IP-enabled nodes shipped in 2000, ODVA has been busy adding capabilities and extensions to the network through the development efforts of its Joint Special Interest Groups – working groups that focus on a particular technology or application need. These efforts include CIP Sync, which provides support for IEEE 1588 for synchronization of clocks and timestamps within a control environment. IEEE 1588 is the fundamental synchronization method used by CIP Sync.

Integrated Architecture Supports Alarm & Event Management

CPAS requires that alarms cause external events instead of or in addition to logging an alarm. The result may be as simple as publishing a variable or a synchronization semaphore, or the initiation of a sequential function chart (SFC) program or procedure. By embedding alarming in the controller, the integrated architecture easily allows alarms to be integrated into the control

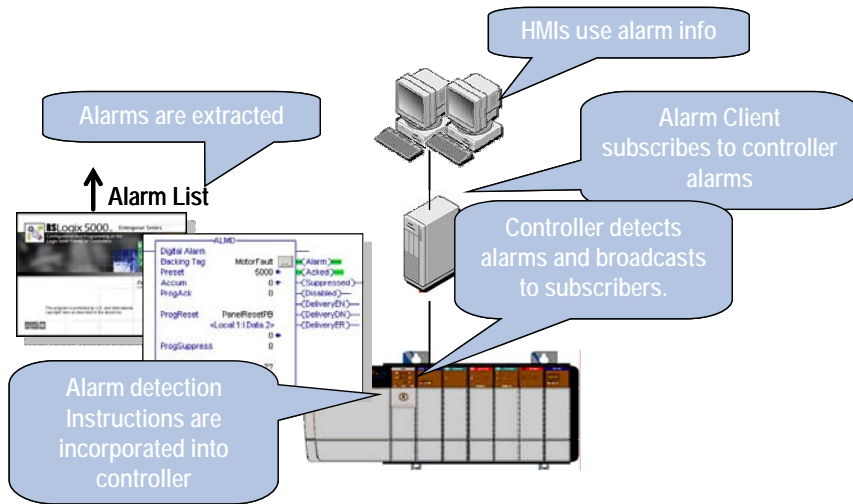
of the process. With Integrated Architecture, the end user only programs the alarm once. No HMI tags are required.

The controller performs all alarm processing. This eliminates data polling and reduces network overhead and controller processing. Alarm states are managed by the controller, making it easier to perform tasks such as suppressing nuisance alarms. Alarm time stamps are also more accurate since time stamps are applied directly by the controller. Future support for CIP Sync services will allow alarm time stamp data to be synchronized with sub-millisecond accuracy, enabling network-wide first event detection.

Rockwell Automation's Advanced Process Control Capabilities

Advanced process control is necessary for any company serious about process automation. Rockwell Automation has experts dedicated to APC. In addition to a core team located in their headquarters of Milwaukee, WI and Cleveland, OH, an advanced process control Center Of Excellence is located in Prague and provides engineering services for projects.

To date, the group has completed projects in the automotive, food, cement, and pharmaceutical industries as well as some pure continuous processing applications, such as those found in the oil & gas and water & wastewater industries. For the pharmaceutical industry, the company has capabilities in data mining and analysis projects related to Process Analytical Technology (PAT) initiatives.

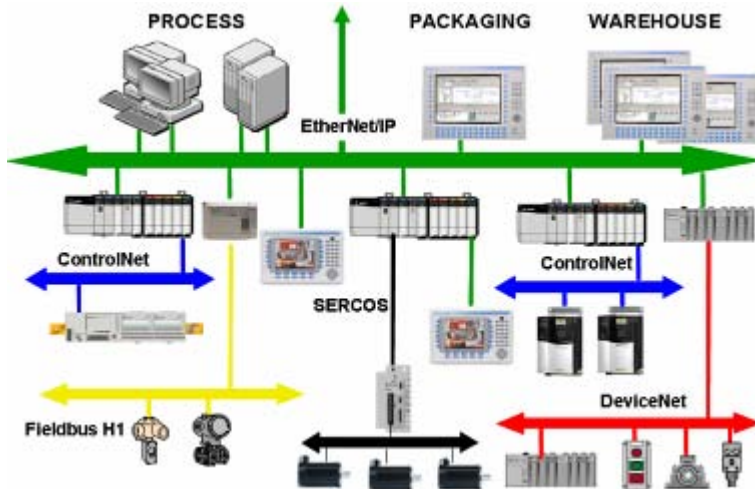


Integrated Architecture's Controller-Based Alarms & Events

In addition to partnerships with third party suppliers of APC products, Rockwell Automation provides an integrated application enabling customers to create their own custom fuzzy logic control blocks for use in Logix controllers. They are also working on a set of model-based predictive control instructions for an upcoming release.

Integrated Architecture Supports & Incorporates Standards

The CPAS model has its foundation in standards. ARC defines standards as detailed descriptions of technological functionality certified by an international independent organization in the area where the standard applies.



Integrated Architecture Embraces Open Network & Interoperability Standards











If the temptation to move into a proprietary mode is followed, it will take a long time to recover because your destiny is in someone else's hands. Choices should broaden not limit future options. Standards promote choices.

Standards supported by Rockwell Automation in Integrated Architecture include IEC 61131-3 for programming and configuration and ISA-88 structures for batch and procedural applications. ISA-95 is supported as well. In the realm of networking and device connectivity, Rockwell Automation supports Foundation Fieldbus, HART,

EtherNet/IP, DeviceNet, and ControlNet protocols and is represented in board level positions within their supporting organizations, as well as in the FDT Group. The company has also been a long-time supporter of OPC UA.

Integrated Architecture Recent Successes & Future Roadmap

Rockwell Automation is steadily winning process projects with their Integrated Architecture system. ARC recognized Rockwell Automation's emergence among the leading global DCS suppliers in 2005. The company captured more process share in 2006, and ARC expects this trend to continue in 2007. Rockwell Automation is the number two batch control system supplier worldwide. According to the company, its process business has grown substantially over the past several years. Rockwell Automation and Integrated Architecture have made it onto the approved vendor list at DuPont and other process automation leaders. Voith Paper Automation selected Rockwell Automation as its premier process automation supplier for its paper machine retrofits in North America.

	Food <ul style="list-style-type: none"> • Process Monitoring & Historian • CIP Systems • Milk Pasteurization • Dryer & Evaporator Controls 		Specialty Chemical <ul style="list-style-type: none"> • Formulation & Mixing Optimization • Chemical Synthesis • Separation Processes • Resin and Polymer Production
	Beverage & Brewing <ul style="list-style-type: none"> • Digital Blending • Brewhouse Control • Syrup Room • Filtration Room 		Pulp & Paper <ul style="list-style-type: none"> • Paper Machine • Digester • Recovery Boiler • Stock Prep
	Life Sciences <ul style="list-style-type: none"> • Bioreactor • Formulation & Filling • Solid Dosage Suite • Fermentation 		Oil & Gas / Energy <ul style="list-style-type: none"> • Emergency Shut Down Systems • Offshore Well Head Control • Bio-Diesel & Ethanol Production • Compression plant, NG/LNG Processing
	Home, Health, & Beauty <ul style="list-style-type: none"> • Batch Mixing Optimization • Tracking & Tracing • Compact Batch • Ingredient Transfer 		Mining, Aggregates, & Cement <ul style="list-style-type: none"> • Kiln Control • Plant Process control • Mineral Slurry • Precious Metal Processing
	Metals <ul style="list-style-type: none"> • Blast Furnace Control • Aluminum Smelter Control • Continuous Caster • Rotary Mill Control 		Water & Wastewater <ul style="list-style-type: none"> • Water Treatment Plant (Municipal) • Water Treatment Plant (Captive) • Clarification • Chemical Feed and Disinfection

Rockwell Automation Has Won Many Projects in Traditional DCS Applications

Rockwell Automation Unifies Process & Discrete Domains for Plantwide Control

Rockwell Automation's goal is not just to penetrate the process industries, but to go after the total scope of plant control across a range of industries. Rockwell Automation's expertise in the areas of drives, high-speed motion, safety, and discrete automation give the company significant presence in process plants. The company's ability to integrate high-speed discrete, drives, and motion control applications with process applications opens up a new realm of plant-wide optimization for its core industries.

In addition to targeting industries that uniquely benefit from a solution that incorporates process control with discrete applications, Rockwell Automation has formed specific vertical industry teams to deliver industry-focused applications. This internal expertise is being augmented by Rockwell Automation's network of specialty system integration partners. Rockwell Automation also has a wealth of application domain knowledge and provides turnkey projects through its internal systems integration organization.

The company is also strengthening relationships with key OEMs to embed Integrated Architecture based solutions into their equipment deliveries, using the same technology for OEM equipment that a user employs at their

plant greatly reduces integration costs. This is particularly effective for applications such as packaging, where many top tier end users are already demanding that OEMs provide them with solutions that enable seamless integration.

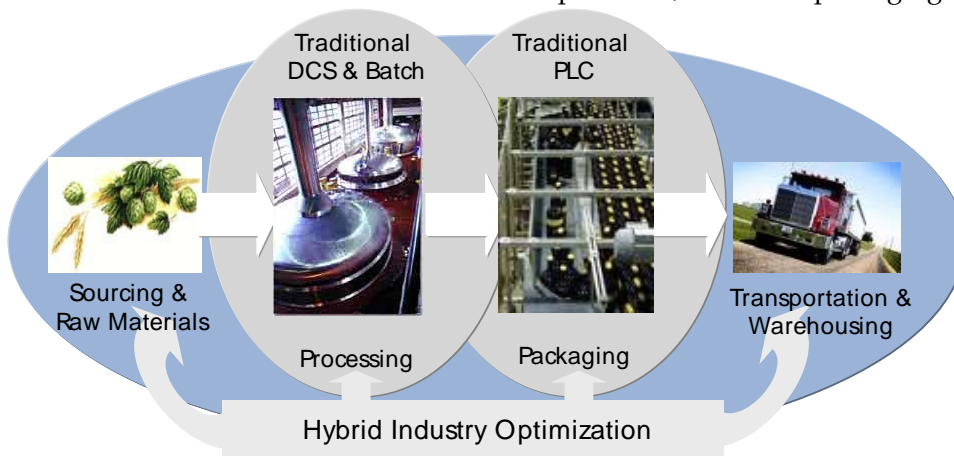
The value proposition of a completely integrated manufacturing plant is one that has particularly eluded many users in the batch and hybrid industries, particularly among second-tier manufacturers. Traditionally, the process side of these plants, such as the brewhouse in a brewery, is strictly focused on the process automation side of the equation. Similarly, the discrete side of operations, such as a packaging line in the same brewery, has

different skill sets among its workers and typically thinks little about the process side of the plant.

True operational excellence and maximum plant performance cannot be realized without the integration of all aspects of the manufacturing process, from the raw materials through the manufacturing process through packaging and distribution.

Add to this the need to maximize the usage of human and capital resources and you can see the value proposition. Integrated Architecture is unique in that it can offer a complete view of the entire plant across all aspects of the manufacturing process with a single unified platform for engineering and configuration, visualization, control, and asset management.

Rockwell Automation can articulate this value proposition effectively to the domains of the plant that need to understand it most. Rockwell Automation can combine its strength in these domains with its growing presence among the process side of the business to drive a significant financial impact on manufacturing. The future of manufacturing rests with a knowledge-based workforce that can have free access to all of the information required to do their job properly and, more importantly, make intelligent and timely decisions about how to improve plant performance.



Optimization in the Hybrid Industries Requires a Unified View of the Plant

Rockwell Automation Expands Batch Capabilities

Rockwell Automation has been in the batch business for a long time and is leveraging this experience in its process automation systems business. In ARC's view, all processes are batch processes in some way, and the inclusion of ISA-88 standard methodologies is part of the CPAS framework. Rockwell Automation's batch strategy extends from basic unit-level func-

Opportunity	Benefit
Batch Cycle Time	10 to 50% reduction
Engineering Cost	60% reduction over 3 Projects
Recipe Development	30% Faster
Re-validation	50% Faster
Throughput	3 to 20% Increase
Commissioning Time	33% Reduction

The Value of ISA-88

tionality in the Logix control layer of their architecture to more advanced batch management functions with the FactoryTalk integrated production and performance suite of applications in the supervisory layer.

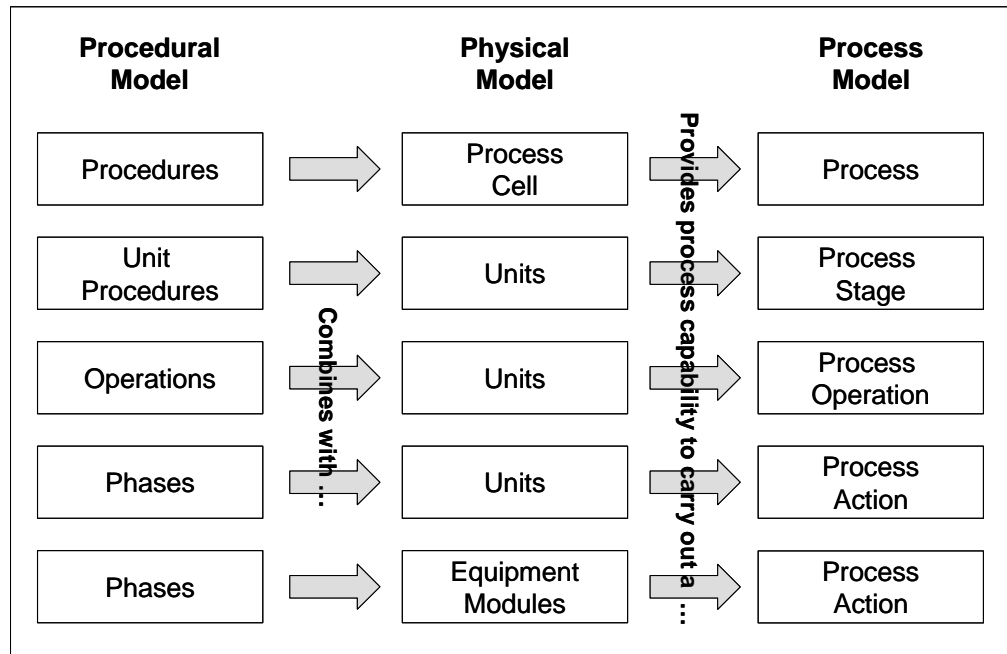
Rockwell Automation has heavily embraced both the ISA-95 and ISA-88 standards, and has added ISA-88 methodologies to its Integrated Architecture controllers. The company's key batch customers demand

more controller level functionality for batch control. Functions such as phase management have been incorporated in the controller as a result. The phase management function embeds ISA-88 compliant phase state model for structuring the application and managing its runtime execution. Its design is easily synchronized with procedural and formulation elements of the recipe definition when used with the batch production management functionality at the supervisory level. Other key new additions to the company's supervisory-level batch capabilities include electronic signature capabilities, procedure execution, and parameter report verification.

The seamless integration between Logix and FactoryTalk offers benefits for manufacturers by connecting disparate applications and improving information flow, factors that are essential for meeting today's business requirements including tracking and tracing, security, recipe management, compliance, efficient production, and improved integration with ERP and business planning systems.

Rockwell Automation also provides complete server based batch management functionality. It can be applied to single or multi-unit batch control applications, including those requiring resource arbitration for equipment

or materials. Batch sequencing is provided, as well as recipe management and data collection.



The ISA-88 Batch Control Standard proposes models for batch control application design, which include a procedural model, physical (equipment) model, and a process model

PhaseManager eliminates Phase Logic Interface (PLI) code and reduce development time and errors, helping manufacturers save money and reduce their time to market. It allows management of multiple products and recipes, operations monitoring, batch execution, and event and information logging to reduce downtime and provide valuable history information for genealogy tracking and regulatory compliance. Batch information can be pushed into business-level enterprise applications, allowing management to monitor and control the entire process.

Rockwell Automation’s ability to offer its batch solutions in the context of a true process automation system should provide an impetus for growth for the company’s batch business.

Rockwell Automation also provides functionality for executing and documenting manual procedures. Procedures can be run as standalone operations or tightly integrated with manual procedures. Integrated Architecture provides a complete batch package including batch scheduling, campaign support, material tracking, electronic batch record and electronic signature capability.

The batch capabilities help manufacturers improve programming consistency and information flow across process, batch, and discrete applications to help increase product consistency, improve quality, boost productivity, and ease regulatory compliance.

Rockwell's ability to offer its batch solutions in the context of a true process automation system should provide an impetus for growth for the company's overall process business. More importantly, the company's capabilities in general production and performance management functions greatly enhance its value proposition.

Integrated Architecture Provides a Unified Production Management Framework

In the CPAS framework, production management (alternately referred to as MES), is a domain that must exist seamlessly alongside the domain of control and automation. The amount of data that is available from the plant floor is increasing exponentially, and the ability to turn this data into usable information depends on a production management environment that is seamlessly integrated with control and automation as well as ERP and other business and production planning systems. FactoryTalk serves as the single software environment for production management applications within Integrated Architecture.

The applications are placed under six primary production disciplines - Design and Configuration, Quality and Compliance, Production Management, Asset Management, Data Management, and Performance and Visibility. These map to the ARC definition of production management. Design and Configuration are covered earlier in this report in the scope of the overall process automation system offering.

Production Management

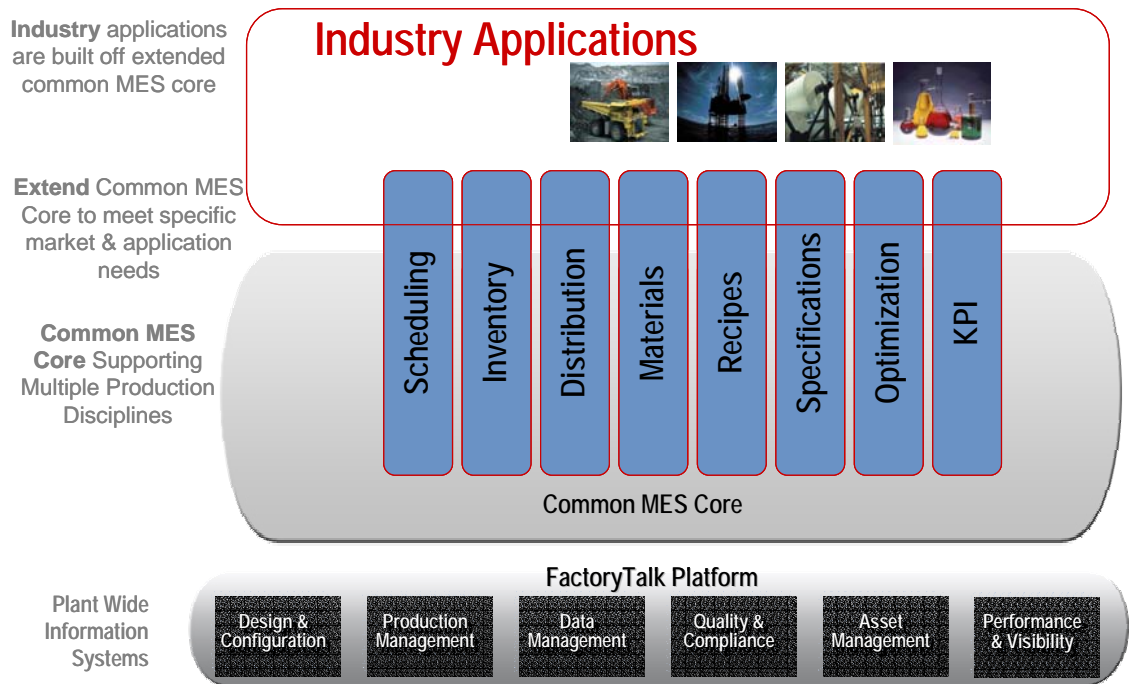
The Production Management domain within Rockwell Automation's Integrated Architecture involves the real-time coordination across plant-wide production processes such as order scheduling and execution, order and

material tracking and genealogy, resource management, and multi-site production synchronization.

To serve the production disciplines, Rockwell Automation has coordinated the scheduling, production, simulation and batch execution as well as the common plant model coordination views for production supervision and operations.

Data Management

The Data Management aspect of Integrated Architecture involves the tools and methods to use for collecting, transforming and integrating production information, including event, process, or master data collection and storage, integration and workflow across disparate systems, tools to organize, synchronize, archive and aggregate data, and both automated and manual data collection. This capability starts at the most basic level in the embedded process automation system historian. According to ARC’s CPAS model, the plant historian function will continue to play a key role in operational excellence. Synchronization will move the historian from independent and separate plant information management software (PIMS) package back to being an integral CPAS historian.



Focus on Production & Performance: Rockwell Automation’s MES/Production Management Strategy Uses FactoryTalk to Build a Common MES Core and Extends this to Provide Industry Focused Applications

Provides reliable process data collection
Data collection and storage
Analysis of process parameters
Graphical visualization
Enterprise-wide reporting
Enables Effective Data mining
Standard Time-Series template
Customized analysis tools
Additional set of charting tools to drill into data
Bar Graph, Grid, Pie Chart, Pareto, etc.
Time-toolbar simplifies selecting desired time boundaries
Historian can also analyze data collected by other applications

Data Collection with the Data Historian

Rockwell Automation continues to build on the functionality and capabilities of the historian. Future product plans include historians that offer multi-layered data collection and storage functionality. Integrated Architecture addresses enterprise business integration needs by leveraging IBM Websphere technology. Integrated Architecture provides a comprehensive set of adaptors and data management workflows or “collaborations” necessary to tie in critical MES and production management systems to ERP and other business and product planning related systems. Systems commonly integrated with Integrated Architecture include SAP, JD Edwards, Oracle, Maximo, and others.

Performance & Visibility

The realm of Performance and Visibility enables the creation of windows into the process so manufacturers can make decisions. Role-based operator interfaces and dashboards provide situational displays at the process equipment, line, plant, and enterprise levels. Analysis and reporting tools indicate process metrics such as Key Performance Indicators (KPIs), energy utilization and overall equipment effectiveness (OEE).

Quality & Compliance

Quality and Compliance involves the tools that ensure that operational processes and procedures meet standards or specifications, simplify regulatory compliance and reporting, enhance product and process consistency, and improve first-pass quality by providing an automated, proactive quality environment.

Asset Management

Asset Management involves the tools that optimize maintenance and plant operations to improve resource availability, audit operator actions, and device health, perform diagnostics, device configuration, instrument

calibration, and real-time monitoring, and provide risk mitigation and change management procedures. Rockwell Automation's asset management offerings integrate data from rotating equipment, drives, PLCs, and other equipment in the plant and serves as a change management tool. The plant asset management (PAM) functionality manages configuration, troubleshooting, and maintenance for process field instrumentation and fieldbus-compatible devices and is compatible with both the EDDL standard and Field Device Tool (FDT).

Service-Oriented Architecture

Rockwell Automation FactoryTalk services include Directory, Security, Live Data, Diagnostics, Audit, and Activation. FactoryTalk Alarms and Events will be featured in an upcoming release. This allows defining plant-floor resources once, such as tags, displays, alarms, users, etc., and then allows simultaneous access to those resources across system boundaries. This design emulates Internet methodology, meaning that it is "Federated". This implies that the data remains distributed in its original, native environment. Federated data is not duplicated, it is distributed and not centralized, and can reside directly in automation devices without being replicated.

The Directory design emulates Internet methodology, meaning that it is "Federated". This implies that the data remains distributed in its original, native environment.

Directory & Security

FactoryTalk Directory offers a common address book of resources, the functionality of a single database in a distributed environment, location transparency with no embedded physical location or machine information, and a common namespace for multiple servers, databases, and third-party OPC servers. FactoryTalk Security service supports multiple authentication providers and is compatible with Windows 2000, Windows XP, and Windows Server 2003. This extends native directory and security functionality for external integration to provide robust, seamless, fault tolerant and redundant connect/disconnect/reconnect between clients and servers.

Diagnostics

FactoryTalk Diagnostics provides the ability to log errors, warnings, and information to a central location. FactoryTalk Audit Service maintains a comprehensive record of any changes made to the manufacturing system,

and Activation provides common software license management for all products.

Integrated Architecture for Process: Strengths & Challenges

ARC feels that Rockwell Automation's primary challenges for the Integrated Architecture in the MES area are to meet the scheduled release dates planned over the next several years, to provide preferred integration to their large non-Logix installed based of PLC-5s and SLCs that are not going away anytime soon, and to demonstrate competitive differentiation.

Rockwell Automation is strongly promoting Integrated Architecture as a multi-disciplined information platform that is complementary to their multi-disciplined control platform, which has been tremendously successful.

This market has solution offerings from companies ranging from the traditional full line automation suppliers, to niche production management and MES companies, to HMI software suppliers, and even some ERP suppliers. MES solutions are offered by PLM suppliers as a part of their design/build/support solutions. Being inherently tied to product development and manufacturing process design has positioned the PLM suppliers in the traditional production management space for some time. Rockwell Automation must document and communicate business benefits to their installed base, and leverage their Premier Integration differentiation.

ARC is encouraged that Integrated Architecture offers an extremely broad portfolio of modules and solutions and can provide a single infrastructure for plant-wide information management. Rockwell Automation is strongly promoting it as a multi-disciplined production information platform that is complementary to their multi-disciplined control platform, which has been tremendously successful. If that model is followed for plantwide information and accepted by the marketplace in a similar fashion, Rockwell Automation should be poised for much success. The company's investment and focus on the plant-wide information space is now paying dividends in the form of a unique strategy and real progress.

Rockwell Automation Expands Process Solutions & Service Offerings

Service is the fastest growing segment of the automation market today, and with good reason. The vast pools of engineering expertise that used to exist at major user companies have shrunk to critically low levels. Many of the automation services that are required throughout the lifecycle of a system

Rockwell Automation Services & Support						
Predict		Prevent			React	
Assessment Services	Condition Monitoring	Asset Management Services	Safety, Network & Security Services	Training Services	OnSite Support Services	Repair Services
Plant Baseline Evaluation	Protection Systems	RAAMP – MRO Process Management	Network Design & Evaluation	Instructor-led Training	ProtectionPlus Startup Services	Remanufacturing Services
Installed Base Evaluation	Surveillance Systems	Spare Parts Management	Safety Services	Self-Paced Training	Extended Parts & Labor Warranty	Exchange Services
Integrated Performance Assessment	Data Collectors	Repair Shield-Annual Repair Agreements	Security Program Development/Deployment	Competency Testing	PerformancePlus Preventive Maintenance	RepairPlus Services
Reliability Program Assessment Services	Sensors				Conversion Services	Renewal Parts
Safety Assessment Services	Condition Monitoring Services				Embedded Engineer	Spare Parts Inventory Assurance Services
Control Security Assessment Services		Remote Support Services			Callout Services	
		TeamSupport 360 Services	TeamSupport Services			TechConnect Support

or facility can no longer be performed in house. Users are looking to the next logical choice for these services -- the suppliers that provide them with the automation products, systems, and software that keep their plants running.

Any supplier making a serious play in the process automation business must provide a suite of services from engineering and design through system installation and post sales maintenance

Rockwell Automation has a Broad Services & Support Portfolio

and support. End users in the process industries typically demand total solutions and need to supplement their internal capabilities to manage systems effectively. Rockwell Automation is growing its services business to meet the demands of its process industry customers. This is a delicate balancing act for Rockwell Automation, which also must manage its many relationships with system integrator partners.

Scope of Services

Rockwell Automation offers a full scope of project services from consulting to engineering and design, commissioning, startup, and after sales service. Rockwell Automation Manufacturing and Process Solutions (MPS) business is the primary automation service provider for the company. Rockwell Automation has been delivering turnkey applications for twenty-five years. Services from MPS include Professional Support Services; Training; Asset Management Solutions; Process Control Solutions; Software Applications

and Solutions; and Consulting Services for Engineering, Production Management/ MES, and Integration. Rockwell will also soon be launching Process Asset Reliability and Optimization services.

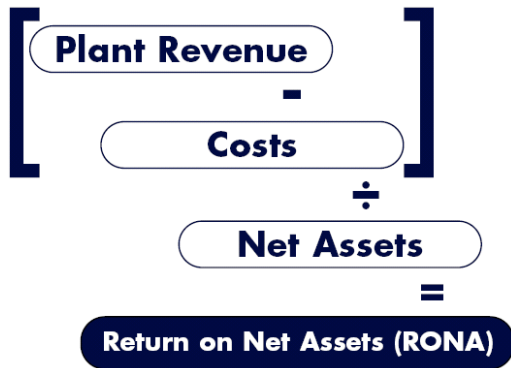
Engineering Services

Rockwell Automation offers a complete scope of engineering services for process automation, including system implementation for process and discrete industries, batch automation, production management, and advanced process control.

Maintenance & After Sales Service

Rockwell Automation maintenance and post sales service provides manufacturers and end users with improved productivity and financial stability by implementing a strategic approach to maintenance that is predictive,

preventive, and reactive. By utilizing this approach, companies can adopt a new perspective on maintenance, one that no longer sees maintenance as an expense, but a strategic asset that drives profitability.



Rockwell Automation is Encouraging Manufacturers to Align their Maintenance Strategy with RONA

To turn maintenance into profit, Rockwell Automation encourages manufacturers to use key metrics such as return on net assets (RONA) and overall equipment effectiveness (OEE) to measure the success of their maintenance strategy. Improving the management of spare parts and the MRO process for automation assets can improve RONA and profit through lower repair costs,

fewer deployed assets, and fewer spares for those assets.

Predictive, Preventive, and Reactive Maintenance Philosophy

According to Rockwell Automation, one single maintenance method approach does not result in the true potential for realizable business results. By utilizing a strategic approach to maintenance, which includes the right combination of predictive, preventive, and reactive methods, the desired results will be attained.

A predictive approach should be applied on critical and essential parts of production, when downtime avoidance is critical, if product quality is af-

ected, and where repair and replacement costs are high. Preventive maintenance is a time-based approach, which anticipates and prepares for planned downtime. Actions are performed on a pre-determined, periodic basis. A preventive approach should be applied for networks, spare parts, and equipment when failure modes or issues are well established, where warranty procedures require it, and when cost of repair or replacement is relatively small.

Finally, a reactive maintenance approach is a “run it till it breaks” approach. No routine tasks are performed and equipment is repaired or replaced only when obvious problems occur. A reactive approach should be applied to handle unexpected issues and in remaining areas when length and frequency of downtime is not critical, where product quality is unaffected by downtime, and if repair and replacement costs are not an issue. When a reactive approach is utilized, it is important to have the right technical resources and tools available to resolve issues in an acceptable period.

Rockwell Automation has aligned their entire Service & Support portfolio to the predictive, preventive, and reactive maintenance model. Predictive Maintenance includes Assessment Services, Condition Monitoring, Asset Management Services, and Remote Support Services. Preventive Maintenance includes Asset Management Services (parts management), Remote Support Services, Safety, Network and Security Services, On-Site Support Services, and Training Services. Reactive Maintenance includes OnSite Support Services, Repair Services & Renewal Parts, and Remote Support Services.

Asset Management & Condition Monitoring Services

Embedded within its Asset Management Services, Rockwell Automation Repair Services include remanufacturing and exchange services, as well as renewal parts and obsolete parts manufacturing. Seventeen ISO 9000/14000 certified global remanufacturing locations perform repairs on Allen Bradley, Reliance Electric, and third-party products. Rockwell Automation Exchange services consist of over 15,000 remanufactured Allen-Bradley catalog items inventoried at nine global part hubs, with many parts available for next day delivery via Advanced Exchange.

Rockwell Automation also offers condition monitoring services, including Reliability Services, Analysis Services (vibration, infrared thermography, oil), and Engineered Project Services. People provide expertise, experience

and packaged services to assist customers with their asset management requirements.

Manufacturers use condition monitoring to help lower inventory costs, reduce spare parts, schedule maintenance, boost availability, increase capacity and throughput, reduce unplanned downtime and planned downtime duration, lower meantime to repair (MTTR), and improve safety and quality. Condition monitoring data can be used with CMMS and other plant floor systems as part of an overall Condition-based Maintenance (CbM) program.

Training Services

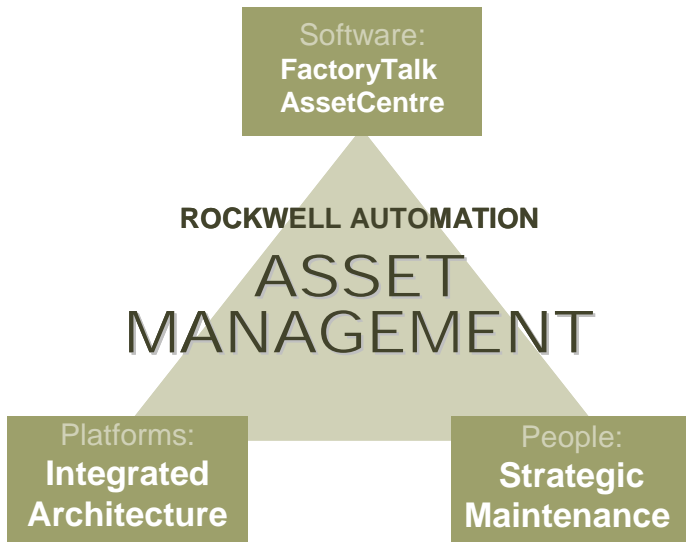
Rockwell Automation Training Services is strong globally for the company and includes over 250 standard open enrollment classes conducted by professional instructors. Tailored and custom courses, as well as self-paced and on-line training, are also available.

On-site and Remote Support Services

Field service engineers are dispatched from over 100 offices in 50 countries to deliver Rockwell Automation On-Site Support Services. The appropriate On-Site Support Services for the customer’s maintenance strategy are often

identified through a Plant Baseline Evaluation Service. This service includes a complete evaluation and analysis of the condition and performance of a manufacturer’s control system equipment. Recommendations from the evaluation may include implementation of preventive maintenance services, which include documentation of system specifications, electrical, environmental, and mechanical inspection, measurement, and trending of key performance parameters, software program revision check, and upgrade.

For manufacturers that require a dedicated automation specialist for an extended period,



Rockwell Automation’s Approach to Asset Management Includes Software, Platforms, Strategic Maintenance Methodologies and Services

Rockwell Automation will provide a full-time, on-site Embedded Engineer for the required length of time. Field service engineers are also available on a 24/7 callout basis to meet reactive needs.

Rockwell Automation's Remote Support Services consist of a global customer support center network designed to provide real-time help 24x7x365. Through TechConnect Support, companies can directly access over 300 technical support specialists with fully equipped workstations and labs to simulate customer problems. For enhanced support of key equipment, systems, and applications, TeamSupport Services provide a designated support team familiar with the system and application and the ability to remotely access it to facilitate troubleshooting. TeamSupport360 Services add proactive remote monitoring of critical alarms and process parameters to facilitate troubleshooting and identify potential problems. Should a problem be identified, plant personnel are immediately notified and suggested corrective action is provided. Through this proactive response, problems are often resolved before a downtime situation occurs.

MAP Services

Rockwell Automation offers Manufacturing Assessment Planning (MAP) services, which are designed to guide the end user organization through an assessment of the current manufacturing with the ultimate goal of improving plant performance. MAP consultants assess the interplay of business and production factors that drive production performance in operations.

Rockwell Automation offers Manufacturing Assessment Planning (MAP) services, which are designed to guide the end user organization through an assessment of the current manufacturing with the ultimate goal of improving plant performance.

MAP services are offered in three levels. The Assessment MAP delivers a rapid diagnosis regarding high-impact capital investments, process improvement programs, cost reduction initiatives, and productivity tools. The Value MAP engagement allows end users to quickly determine how their plant can benefit from better information flow and or automation solutions. A Strategy MAP engagement creates a "future state" vision for desired plant or enterprise improvement projects.

Rockwell Automation Services: Business Strengths & Challenges

ARC feels that Rockwell Automation has assembled a strong, comprehensive portfolio of services & support. ARC agrees with the philosophy that

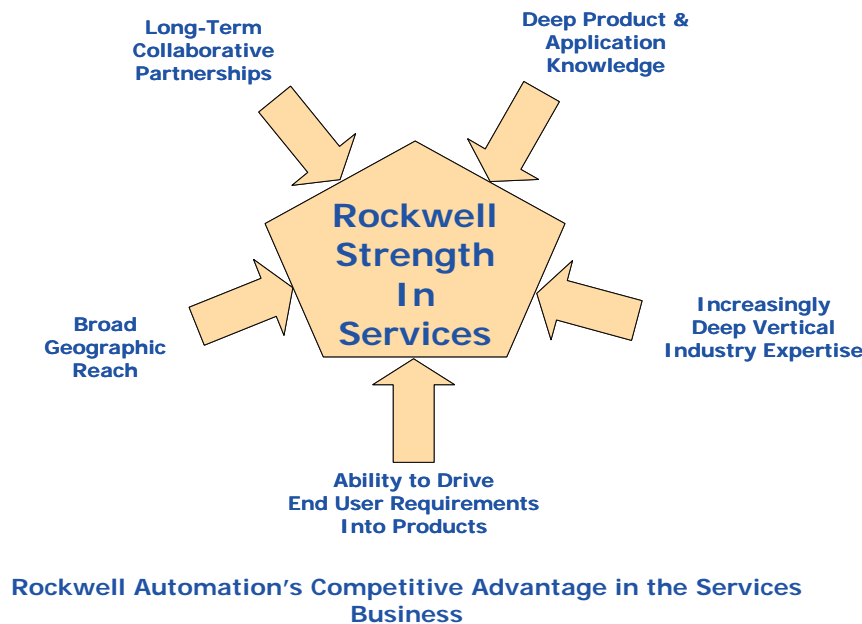
manufacturers who deploy services and support based on a well-designed maintenance strategy can effectively reclassify maintenance from an expense to a strategic asset. Rockwell Automation has added their integrated condition monitoring program to their complete multi-disciplined integrated architecture story, with emphasis on integration to both the Logix and FactoryTalk platforms.

Challenges that Rockwell Automation faces to ensure continued success of their Services & Support offerings include educating their customers that support and maintenance services can be strategic competitive advantages, not just necessary evils, emphasizing key metrics such as increased return

on net assets (RONA) and overall equipment effectiveness (OEE).

The company also has the challenge of educating their customers about their multiple mode philosophy of predictive, preventive, and reactive maintenance so that there is sufficient comprehension and recognition of their full Services & Support portfolio. Meeting these challenges should result in continued strong demand for these services as well as

increased profitability for both the manufacturers who utilize these services as well as for Rockwell Automation.



Process Automation System Migration Strategies

Control system migration is a primary issue among many automation users today. Few new plants are being built, and capital expenditures continue to shrink. With the increased focus on return on assets (ROA) and Operational Excellence (OpX), users must find ways to migrate effectively from

one generation of control system to the next, whether it is from the installed supplier or a competitor. Suppliers are offering an increasingly varied range of migration options for users.

ARC estimates that there is roughly \$65 billion worth of automation systems installed today that are at the end of their traditional lifecycle. With so many older systems installed and so many new ones emerging, control system migration strategies are becoming important considerations for enabling increased plant performance and the adoption of new automation strategies.

Rockwell Automation has a cogent strategy for control system migration that addresses both the company's installed base of process automation systems and competitor platforms. The company offers competitive migration solutions for ABB (Bailey Net 90 and Infi 90), Emerson (Provox), and Honeywell (TDC 3000/2000, PlantScape).

Rockwell Automation has a cogent strategy for control system migration that addresses both the company's installed base of process automation systems and competitor platforms.

Rockwell Automation can also provide migration of Rockwell and non-Rockwell PLCs. A core part of the Integrated Architecture is its networking (e.g., EtherNet/IP) and interoperability and connectivity to essentially any legacy system. Rockwell has conversion utilities that it provides through PLC conversion services, as well as preferred connectivity and re-use of many existing field devices and device networks within the Integrated Architecture. Rockwell is unique in its ability to move PLC-based process and discrete applications easily into a plantwide environment, on a common control platform, integrated with applications from other control disciplines.

To protect an end user's intellectual property and engineering investment, Rockwell Automation promotes a phased approach to migration. Migration can occur with something as simple as extending their integrated production and performance applications over existing DCS or PLC system scopes. When an end user is ready, actual migration of the target control system can commence.

The company offers a stepwise migration that starts at the HMI level and drills down to the controller and I/O level. Rockwell Automation also offers services (using internal conversion tools and pre-defined engineering strategies) for converting custom graphics and control strategies that facili-

tate this process. With Bailey systems, for example, the company offers a conversion program that allows the entire Bailey system HMI layer to be replaced by Integrated Architecture.

At the control layer, Integrated Architecture offers interoperability with Rockwell Automation and competitor's process controllers and PLCs. At the I/O layer, Integrated Architecture offers migration to competitors' systems using either cabling solutions or, in the case of many competitor PLCs, swing-arm interfaces. The company also offers an I/O scanner that enables Logix controllers to connect to existing Bailey, Fisher, and Honeywell I/O, while cable assemblies enable Logix controllers to connect to Bailey, Fisher, and Honeywell legacy termination blocks.

Rockwell Automation supports its own installed base of systems. Rockwell does well at providing advanced notification of a change in sales status for systems and components. Even after Rockwell discontinues sales of a particular control offering, Rockwell has a proven history of providing manufacture and supply of replacement parts for several years. This should provide confidence in the longevity of process control and plant-wide systems.

Migration Solutions & Services

Rockwell Automation offers migration solutions, which are bundled packages consisting of software and hardware that migrate a user system from a competitor's legacy platforms to Integrated Architecture. These include tools such as the FactoryTalk View HMI Database tag converter and FactoryTalk View Faceplate Library, which work with legacy system function blocks. Rockwell Automation also offers the FactoryTalk View PLC HMI Graphic Conversion utility.

Rockwell Automation has also been building its migration services support capabilities. The company has many resident experts that can provide in-depth legacy DCS knowledge that can be required in migration projects. Migration service personnel can provide assessments of migration product and service options for phased conversion from the old system to the target system.

In ARC's view, Rockwell Automation is one of just a few process automation system suppliers that have developed and made commercially available a coherent strategy for migrating from competitor DCS platforms.

Rockwell Automation’s challenge with its own installed base is also not as great when compared to other suppliers, since even the legacy ProcessLogix system was based on the same Logix platform, making migration largely a software related issue. Rockwell Automation must take advantage of every competitive weapon at its disposal if it wants to continue to build an installed base of process automation systems, and having a solid competitive migration strategy is a key requirement.

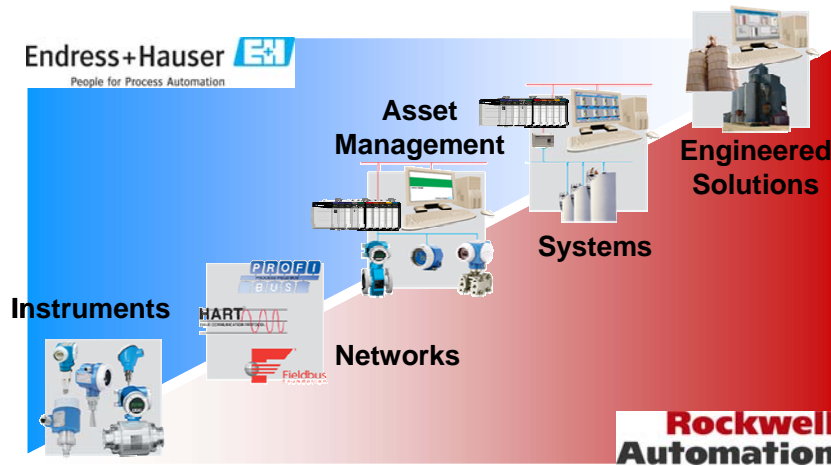
Supplier	Console Migration Phase	Control Migration Phase	IO Migration Phase
Bailey Net/Infi90	Bailey CIU to RA Data Server (OPC Server) Bailey Console Database Converter Bailey “look” Faceplate Library for SE	Bailey to CLX comm. via OPC Gateway & ProcessLinx Bailey Function Code to Logix (FB) Library	Bailey to RA IO Comparison Chart Bailey TU to 1756 IO Cable Designs
Honeywell TDC2000/3000	Honeywell App Node to RA Data Server (OPC Server) Honeywell Console Database converter Honeywell “look” Faceplate Library for SE	Honeywell App Node to CLX Communication via OPC Gateway and ProcessLinx Honeywell Function Code to Logix (FB) Library	Honeywell to RA IO Comparison Chart Honeywell FTA to 1756 IO Cable Designs
Emerson Provox	Provox HDL to RA Data Server (OPC Server)		Provox S20 to RA IO Comparison Chart Provox S20 FTA to 1756 IO Cable Designs

Rockwell Automation Migration Solutions for Competitor Systems

Endress+Hauser Partnership Provides Total Process Automation Solution

Just as Rockwell Automation needs a good migration strategy to build its installed base of Integrated Architecture, it also needs some level of expertise and solutions capability at the process field device level. ARC’s CPAS model relies heavily on the data available from intelligent field instrumentation, and views intelligent field devices as a key part of the system. Rockwell Automation has developed a strong alliance with one of the leading worldwide field device suppliers – Endress+Hauser.

The Endress+Hauser alliance, however, goes beyond simply offering field instrumentation in conjunction with Integrated Architecture automation systems. It is the focal point for Rockwell Automation's fieldbus and Plant Asset Management strategy and involves joint research and development between the two companies, as well as fieldbus interoperability testing, and even encompasses the integration of Rockwell Automation's own devices, such as drives, into a complete plant asset management solution. The ultimate goal of the alliance is to combine field instrumentation with fieldbus networks, such as Foundation Fieldbus, Profibus, and HART, with asset



Rockwell Automation's Partnership with Endress+Hauser Extends Beyond Field Devices to Include Networks, Asset Management, and Solutions

management capabilities and Rockwell Automation's system capabilities to provide a total engineered solution that is both seamlessly integrated and pre-tested for interoperability.

The Rockwell Automation/Endress+Hauser alliance is targeted at a wide range of process and hybrid industries, customers, and regions. ARC believes the alliance will be effective in

targeting the process industries in general, but the core strength brought to the table by the alliance is in hybrid industries such as food & beverage, life sciences, and water & wastewater. Both companies are strong in these industries and their complementary product and solution capabilities can combine to create a solution that effectively addresses specific industry needs.

An Integrated Asset Management Solution

Rockwell Automation offers a broad asset management solution called FactoryTalk AssetCentre. FactoryTalk AssetCentre is an integrated asset management solution that provides configuration and calibration, predictive and preventative maintenance, and advanced diagnostics tools that reach from the process field device level to other devices in the plant, such as drives, motor control centers, PLCs, robotics, and the process automation system itself.

Rockwell Automation and Endress+Hauser are supporters of the Field Device Tool/Device Type Manager (FDT/DTM) technology that provides a single interface to devices residing on multiple field and control networks. FDT/DTM functionality will also be driven into the joint Rockwell Automation/Endress+Hauser solution in the near future in the form of an FDT container that will support DTMs. Both Rockwell Automation and Endress+Hauser support of standard bus technology and have board level positions on the Fieldbus Foundation, HART Communication Foundation, and FDT Group.

Rockwell Automation and Endress+Hauser also support Enhanced Electronic Device Description Language (EDDL), which is used to describe and present the various characteristics and parameters of intelligent, fieldbus and HART-compatible devices. The OPC Foundation has also announced its support in the continued effort to enhance and standardize EDDL, providing a much-needed interface for upper level software applications.

Interoperability Testing Eliminates Integration Headaches

Interoperability between fieldbus-compatible devices and system hosts requires testing, and Rockwell Automation has established device interoperability testing centers along with Endress+Hauser to ensure a maximum level of interoperability between Endress+Hauser devices and Rockwell Automation products, systems, and applications. After testing, devices are given interoperability statements for certain version levels of Rockwell Automation platforms. Many Endress+Hauser devices are currently being tested, while several Foundation Fieldbus and HART devices have already been tested and Interoperability Statements issued. Internet listings of tested devices, links to DDs or DTM files are available for download. Rockwell Automation has published interoperability statements on its web site.

On the system side, Rockwell Automation is planning system tests for Foundation Fieldbus and HART devices in a large process automation system configuration. The test system plans have been exchanged, reviewed, and approved by each company, and a large test bed is currently in place. This was an important step for Rockwell Automation to become a full-scale fieldbus solutions supplier. The company's heavy emphasis on interoperability testing will not only reap benefits in terms of the company's relationship with Endress+Hauser, but will also provide benefits for any

Rockwell Automation fieldbus implementation project involving instrumentation from the various field device supplier.

Rockwell Automation Process Business Strengths & Challenges

Rockwell Automation is well positioned to take advantage of the growth opportunities provided by the global process automation market. The company has developed a fully functional process automation system that conforms to ARC's CPAS model in key areas, from engineering and

Continue to Develop Integrated Architecture to the target Release Schedule

Continue to Develop Services & Solutions Business

Continue to Cultivate Vertical Industry Expertise

Continue to Expand International Business in Asia, Europe, Latin America

Provide Business Value Proposition to Hybrid Industry Customers who Underutilize Automation

Continue to Develop and Enhance Process Solutions through Endress+Hauser Alliance

Rockwell Automation Process Industry Challenges

configuration to a common hardware platform to presenting information in context to the right people at the right time from any point within the system. The major process automation system players should consider Rockwell Automation as a formidable competitor in the years ahead, in North America and globally.

Rockwell Automation's background in the discrete industries and its large presence in the markets for drives, PLCs, discrete sensors, and motion control provide the company with some unique advantages when it comes to address-

ing the process automation space, particularly for its core target industries such as life sciences, food & beverage, consumer products, fine chemicals, and oil and gas. These industries typically involve a significant amount of discrete and motion control processes that are not typically integrated into a single automation system framework. It is this unified framework across multiple domains of automation that is enabled by Integrated Architecture.

Rockwell Automation does have its work cut out for it. In the process automation system marketplace, the top tier of suppliers controls well over two thirds of the market. The company must provide a superior business value proposition and continue to live up to its release schedule and invest heavily in research and development. Rockwell Automation is not primarily trying to take share away from the big process automation suppliers in their core markets such as refining, petrochemicals, and central station power generation, and this gives the company an edge. The industries that

most underutilize automation to their advantage, such as food & beverage, consumer products, pulp & paper, and water & wastewater, are the same industries that Rockwell Automation is targeting with Integrated Architecture.

Fully Functional DCS Offering with Integrated Architecture
Ability to Integrate Multiple Control Domains from Process Control to Discrete, Motion, Packaging
Strong Presence in Hybrid Industries such as Food & Beverage, Life Sciences, Consumer Products
Large Installed Base of Products and Applications in Many Process Plants
Embraces International Standards such as ISA-88, ISA-95, IEC 1131, OPC UA, Foundation Fieldbus, HART
Strong Network of System Integrator Partners

Rockwell Automation Process Industry Strengths

Rockwell Automation must also continue to build up its capabilities in the area of services and solutions, and it must do this while maintaining its already strong relationship with preferred system integrator partners. Much of the value that suppliers can provide their customers in process automation comes from services and the ability to increase plant performance. Rockwell Automation is already on a solid path to do this with its focus on Overall Equipment Effectiveness (OEE) and other initiatives.

Developing a sound strategy at the field level is another key aspect of success, and Rockwell Automation must continue to build on its alliance with Endress+Hauser. The ultimate goal is to provide solutions for field instrumentation and fieldbus, but more importantly for Plant Asset Management (PAM), predictive diagnostics, and integrating device diagnostics from its large installed base of drives, PLCs, and other non-process related field devices.

Analyst: Larry O'Brien, Craig Resnick

Editor: Dick Hill

Distribution: EAS and MAS Clients

Acronym Reference: For a complete list of industry acronyms, refer to our web page at www.arcweb.com/Community/terms/terms.htm

API Application Program Interface	FDT Field Device Tool
APS Advanced Planning & Scheduling	HMI Human Machine Interface
B2B Business-to-Business	IT Information Technology
BPM Business Process Management	MIS Management Information System
CAGR Compound Annual Growth Rate	MRP Materials Resource Planning
CAS Collaborative Automation System	OpX Operational Excellence
CMM Collaborative Manufacturing Management	OEE Operational Equipment Effectiveness
CPG Consumer Packaged Goods	OLE Object Linking & Embedding
CPAS Collaborative Process Automation System	OPC OLE for Process Control
CPM Collaborative Production Management	PAM Plant Asset Management
CRM Customer Relationship Management	PAS Process Automation System
DCS Distributed Control System	PLC Programmable Logic Controller
EAM Enterprise Asset Management	ROA Return on Assets
ERP Enterprise Resource Planning	RPM Real-time Performance Management
	SCM Supply Chain Management
	SOA Service-Oriented Architecture

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Tel: 781-471-1000, Fax: 781-471-1100, Email: info@arcweb.com
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