

## Using Appliance Transaction Modules to Enable Tracking and Tracing – Supporting The Need for Increased Accountability and Cost Containment – Alex Cunningham, Vice President Sales, Online Development Inc.



### INTRODUCTION

Automated tracking and tracing all aspects of a product from its initial ingredients or components, through manufacturing and into the supply chain, is not only a requirement in industries such as food and pharmaceutical, it has also become a viable strategy for all businesses. From automotive and metals to appliances and consumer goods, companies rely on tracking and tracing to lower material, production, inventory, labor and scrap costs while improving customer satisfaction.

By being able to see, analyze, manage and store selected data in real-time, companies are able to make swift changes to optimize selected areas within their production capabilities. They are also able to document their processes from incoming raw materials, through production and onto the supply chain.

### THE ISSUES

The complexity, cost and ongoing maintenance of these systems have held many companies back from reaping the rewards of automated tracking and tracing. Getting the data from the manufacturing floor to a computer system for analysis and management has been one of the biggest hurdles. Companies often use many different types of automation and computer systems, as well as standalone components

such as weighing systems, RFID systems and bar code readers within their facilities. Exchanging and then sifting data between these various dissimilar data points is often a monumental task.

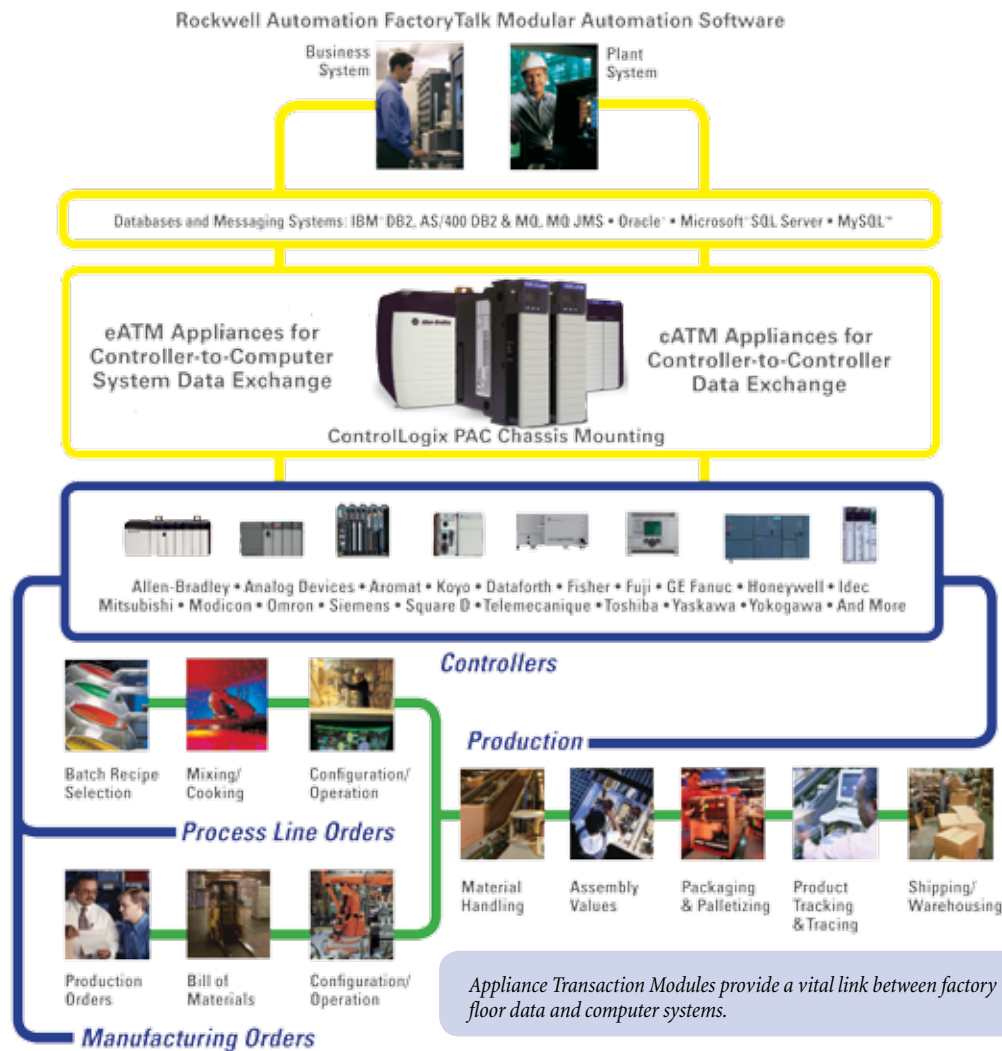
### SOLUTIONS

Today, automation companies are providing various solutions to help companies deploy customized tracking and tracing systems. These solutions enable specific data from dissimilar plant floor devices and controllers to be exchanged with business systems with little or no programming. They are designed for factory floor environments, require minimal training and are scalable to meet future needs.

### *Appliance Transaction Modules – Enabling the Sharing and Management of a Wealth of Plant Floor Data*

These modules are designed to exchange data between controllers and computer systems such as databases and messaging systems – or dissimilar controller types or brands. Online Development supplies two different types of these modules: eATM™ appliances for controller-to-computer system connectivity, and cATM™ appliances for controller-to-controller data exchange.

## Using Appliance Transaction Modules to Enable Tracking and Tracing



Both types are available with specific adapters designed for use in the required computer system or controller environment, i.e., ControlLogix® PAC to IBM® MQ JMS messaging computer system, or Allen-Bradley PLC® to Siemens S7 PLC®.

Both modules install in an Allen-Bradley ControlLogix PAC and receive plant floor data from the PAC's backplane. The eATM appliance connects ControlLogix PACs to computer systems via Ethernet. The cATM appliance connects ControlLogix PACs to installed Allen-Bradley PLCs through EtherNet/IP, ControNet, ENBT, DH485 or DH+ bridges. It connects ControlLogix PACs to Siemens S7 controllers through Ethernet TCP/IP and to Schneider controllers via Modbus/TCP.

Upon installation, the setup utility for these modules automatically displays all connected data points whether they be controller registers or tags and database tables. This utility enables the grouping of any of these data points into transactions for exchange between the computer system or controllers, based on selectable trigger parameters such as time, event, etc. This grouping of specific data at the controller level minimizes the amount of data to be exchanged, reducing polling requirements for the controller to optimize processor performance.

One example of a transaction could be uploading torque values from various workstations to a database as products are being assembled. Another could be tracking vendor bulk material deliveries based on batch and weight from a weigh scale and sending that information to the database for invoice processing, adding to the raw material inventory and assisting in finished product costing.

These appliances also include a store and forward function to save valuable data. Should there be an interruption of data between the appliance and the computer system, the appliance stores the data and sends an alert. When data transfer resumes, the appliance sends all the stored data to the computer system.

Store and forward and other configurable alerts, such as out-of-tolerance conditions, low raw material levels, line stoppages and more, can be sent via TCP/IP or SMTP.

Should tracking and tracing needs change in the future, appliance transaction modules can be easily reconfigured by anyone with the knowledge of PLC or PAC configuration.

## Popular Tracking and Tracing Applications

### Reducing Inventories

Tracking inventory, usage and replenishment levels, enables companies to carry the smallest amount possible, to reduce carrying costs while ensuring that production requirements are met. By monitoring raw material, work in progress and finished goods inventory levels in real-time, companies can develop automated systems for inventory replenishment based on demand. These systems not only lower inventory costs but also optimize worker and machine utilization while meeting customer demand.

### Dynamic Supply Chain Support

As a result of tracking orders through each manufacturing area, companies are able to have a global view of production versus orders. This view provides the information needed to make decisions about production priorities, machine and worker utilization and order fulfillment. Product and pallet identification, as well as shipping and delivery routing can also be added to these systems.

### Product Cost Management

As raw materials are manufactured into finished goods and sent to the supply chain, tracking and tracing provides a wealth of data of actual product costs. Raw materials, machine utilization, labor, scrap and maintenance rates can all be correlated to define actual costs. This information can then be analyzed for areas of improvement to control or lower costs.

### Regulatory Compliance

The food and pharmaceutical industries have stringent USFDA (United States Food and Drug Administration) tracking and tracing requirements that must be followed. This includes the stringent 21 CFR Part 11 and the Bioterrorism Act of 2002, that require food companies to maintain a record for tracking all ingredients and products. Other requirements such as Sarbanes-Oxley accounting reforms and GSA (Government Services Organization) supplier contracts make it important that manufacturing and processing operations track, trace and archive production data.

### Customer Requirements

Many companies are requiring their suppliers to provide a "birth certificate" or manufacturing history of critical parts to ensure quality and performance. These records often become part of the final product's genealogy and used for issues such warranty claims, component performance, rebuild quality, etc.

## ControlLogix System – The Ideal Platform for Appliance Transaction Modules



The ControlLogix system provides discrete, drives, motion, process, and safety control together with communications and state-of-the-art I/O in a small, cost-competitive package. The system is modular, so you can design, build, and modify it efficiently – with significant savings in training and engineering. Power, flexibility and ease-of-use make it an ideal environment for appliance transaction modules.

### Connecting to Popular Factory Automation Software

Appliance transaction modules are ideal for exchanging plant floor and supply chain data with automation software packages such as the Rockwell Automation integrated suite of FactoryTalk® modular software applications. These applications can:

- Provide real-time coordination across plant-wide production processes
- Include tools and methods for collecting, transforming and integrating production information
- Ensure quality and compliance to procedures, standards and regulations
- Provide a window into processes for better decision-making
- Integrate with popular MES and ERP systems

The FactoryTalk Services Platform provides flexibility by enabling the deployment of applications incrementally as needs arise. Since the FactoryTalk Services Platform is based on a common set of shared services and behaviors, training costs are reduced.

## CONCLUSION

Appliance transaction modules provide a simple, yet effective method to connect dissimilar devices, controllers and computer systems for a wide variety of tracking and tracing applications. They enable the development of specific event-based, bidirectional transactions between different brands and types of products without programming. Intuitive screens in the setup utility, as well as drag and drop configuration make startup fast and easy.

These modules are completely compatible with Rockwell Automation ControlLogix PACs and their functionality and cost-savings provide a maximum return-on-investment. By installing in the ControlLogix chassis, there is no added hardware or software to buy, program or support. The flexibility of this controller enables the addition of other tracking and tracing platforms such as SKU/shipping/ingredients label printers, historians and more, to be easily integrated.

eATM and cATM appliances provide a pathway from the plant floor to the full suite of FactoryTalk modular software applications to speed tracking and tracing system development.

## ABOUT ONLINE DEVELOPMENT

Online Development is a fast track developer of factory automation data appliances. Since its founding in 1989, the company has led the industry in developing the technologies needed to enable numerous leading brands of PLCs/PACs to communicate with various field devices or other controllers on the factory floor. It also enables the exchange of bidirectional data between factory floor controllers and computer systems without the need for custom programming.

The technologies developed by the company provide very simple, yet highly effective, connectivity between many proprietary factory automation devices including barcode scanners, modems, printers, robots, HMIs, sensors, RFIDs, popular factory/warehouse network systems and enterprise computer systems.

Headquartered in Knoxville, Tennessee, Online Development is privately owned and has offices in Cleveland, Ohio, Cincinnati, Ohio and Barcelona, Spain.



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