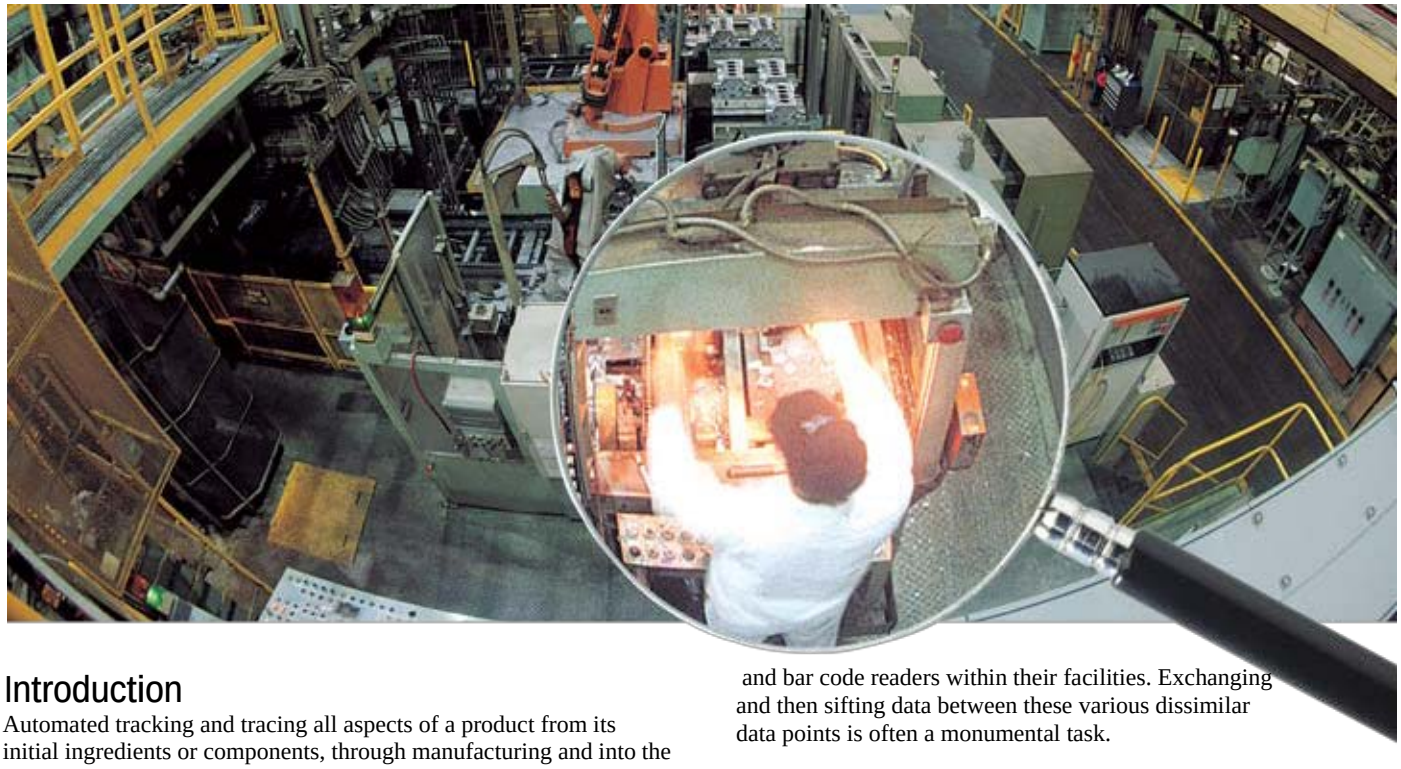
Using Appliance Transaction Modules to Enable Tracking and Tracing

Supporting the need for accountability and cost containment



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 – and mixed controller types or brands. Online Development supplies two different types of these eATM® appliances for controller-to- computer system connectivity, and cATM appliances for controller-to-controller data exchange.

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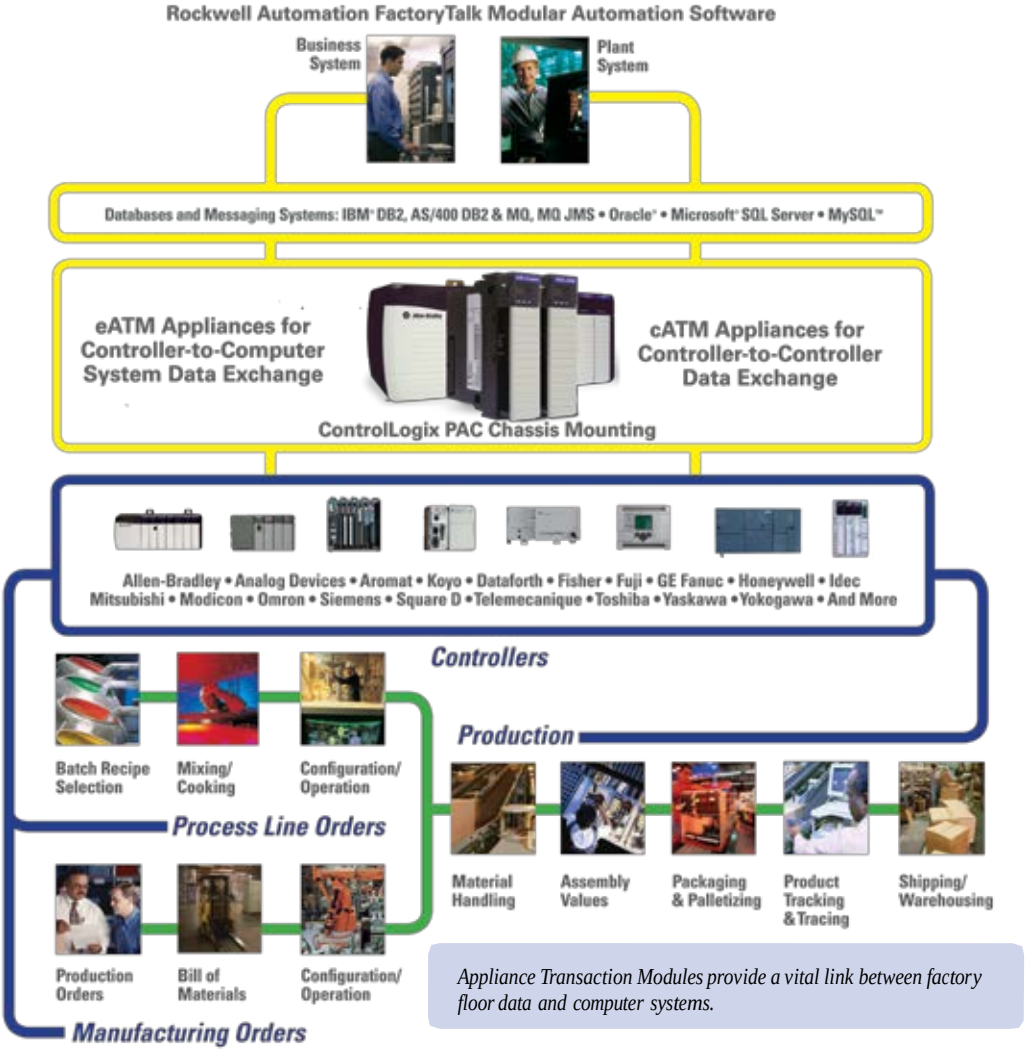

Appliance Transaction Modules provide a vital link between factory floor data and computer systems.

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

eATMs and cATMs install in Allen-Bradley ControlLogix PACs and receive plant floor data from the PAC's backplane or via Ethernet ports. eATMs connect ControlLogix PACs to computer systems...typically for bi-directional data exchange between controllers and a database. cATMs enable data exchange from controller to controller. Both eATM and cATMs can connect to Allen-Bradley PLCs through EtherNet/IP or via bridge modules for ControlNet, DH485 or DH+ bridges or DH485.
They also can connect to Seimens S7 controllers through Ethernet TCP/IP and to Schneider controllers via Modbus/TCP.

Upon installation, the setup tools for these modules automatically displays all connected data points for both controller data and database data. Using a GUI based approach, data exchange is defined including selectable trigger parameters such as time, event, etc. eATMs and cATMs free-up the logic controller from the runtime overhead of message handling. Moreover, the GUI based configuration requires no programming.

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.

The eATM tManager offers both store and forward and failover functions to allow data to be locally buffered or to be exchanged with one or more alternate locations. In the case of store and forward, an interruption of data between the tManager and the computer system, would result in local data storage and the sending of 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 e-mail.

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 FDA (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 Inc. (OLDI) designs and manufactures factory automation products to help manufacturers simplify data transaction, control and communications tasks.

Products include Appliance Transaction Modules (ATM) for both Enterprise and Controller-level data exchange. Enterprise Appliance Transaction Modules (eATMs) simplify and manage the exchange of data between general-purpose computer systems at the plant and enterprise level with factory floor controllers. Controller Appliance Transaction Modules (cATMs) enable connectivity to many brands and types of PLCs/PACs and DCS.

OLDI also has a line of open control products to enable the development of special applications in PLC/PAC and standalone versions.

Online Development also designs and manufactures a variety of controller modules for leading factory automation companies such as Rockwell Automation and ProSoft Technology. It is a Rockwell Automation Global Encompass Partner, a member of Control Systems Integrators Association and ODVA and participates in partner programs from IBM, Microsoft and Oracle.

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