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Nigel King, Senior Software Consultant, SDI Group

Logistics boosted at Magna Automotive
by Wonderware United Kingdom

Goals:
• Magna Automotive was required to increase the number of panel variations to handle the requirements for both the outgoing and new vehicles, which meant an increase in the number of variances of around 17 per cent.

Challenges:
• The project had to be completed in a very short time;
• There shouldn’t be any plant shutdown and production had to be maintained while expansion is being undertaken;
• The new system must show improvement in quality, throughput and space utilization.

Wonderware Solution:
• InTouch HMI;
• Wonderware System Platform.

Results:
• The ease of use of the operator screens required minimal input. This enabled new personnel to operate the plant with very little training;
• On-Time delivery;
• Increased Productivity by an increase in available workforce equating to a headcount re-deployment of 8 per cent;
• Enhanced the Automation and Control System by improving stock control, production planning, and inspection of stock produced, as well as adding advanced, automated reporting capability.
Burton-on-Trent, United Kingdom - Magna Automotive is a major supplier of components to the automobile industry. Faced with increasing demand and the need to improve plant efficiency and product quality, they have decided to re-vamp their manufacturing facility in Burton-on-Trent, UK. This was a major task that had to be undertaken without any stop in production. Magna Automotive selected the Wonderware System Platform because its capabilities provided the ideal solution to address the short project completion schedule and in-project continuous improvements.

Magna Automotive operates a manufacturing and production site at Barton Business Park in Burton-on-Trent. The facility is part of the company’s Interiors Division supplying injection moulded internal door panels to a nearby car manufacturer. It provides parts for two different vehicle models, working on a just-in-time inventory strategy with a four-hour notice period for incoming orders.

**The Situation - Increasing Capacity with Minimum Cost**

The plant manufactures door panels for two vehicle models but there are a number of different variations because of different interior options that are offered to the consumer. A planned model change scheduled for the first half of 2008 has necessitated Magna Automotive to increase the number of panel variations to handle the requirements for both the outgoing and new vehicles. This meant a 17% increase in the number of variances. As a result, additional space was needed at the Burton-on-Trent facility to accommodate the extra production equipment. Magna Automotive wanted to identify the most cost-effective solution that met production needs.

**Seeking at Solution**

SDI Group UK was invited by Magna Automotive to design the automated system for the storage and retrieval of the injection moulded interior car door panels manufactured at the production site. A turn-key solution was required to primarily optimise the existing facility, freeing up valuable space for new equipment, whilst avoiding any disruption to the ongoing operation.

The project’s scope also included enhancing workforce productivity; maximising capacity for future business wins; and increasing operational visibility and control. The solution would have to take into consideration the unique needs of a just-in-time inventory strategy within the automotive sector, which demanded particularly high levels of accuracy, faster completion time and increased product quality.

**The Solution – an Improved Control System Powered by Wonderware**

An essential aspect of the solution was a sophisticated Warehouse Control System (WCS) installed with a Wonderware software solution. The WCS has enhanced the overall control of the manufacturing plant and increased the ability to better manage the site. Wonderware software
provides overall control at each stage of the production process from manufacture of parts, through to storage and then transfer to production areas and drop-off points. This comprehensive WCS not only had to control the automated storage and retrieval system, but the entire life of each part from manufacture and production to the point of dispatch.

A key feature of the WCS is the easy-to-use touch screen operator interface using InTouch HMI (Human Machine Interface). The operator screens were designed for ease of use and minimal operator input. This means that new operators can be introduced with very little training on the software required.

The software also offered greater control over stock, operating an effective FIFO (first in first out) parts usage system, as well as providing a complete audit trail for every part within the facility. The automated solution utilised more than 3,500 sensor points providing useful stock data and enabling the ability to monitor parts trolleys throughout the process. Data could be accessed and inputted via office-based computers or five touch screen monitors situated within the production facility. Each operator station can display a live animated visualisation of the control equipment with pan and zoom functionality. This provides detailed diagnostic information to engineers and operators right on the plant floor. Detail of stock holdings by part and by location with ‘drill down’ comprehensive information is available to the plant personnel. The details and destination of all trolleys moving on the conveyor system are also displayed in real-time. A history of the trolley’s movement is available.

A remote Management PC also provides the same equipment visualisation and stock information but with additional features for supervisors. These features include part definition creation / modification, part to storage lane allocation, user management, problem recovery and software application status display. The Wonderware Historian has enabled data to be stored and collated for reporting purposes, something that was previously processed manually.

The Core of the Solution – Wonderware System Platform

The Wonderware System Platform provides real-time automation supervision for the WCS (Warehouse Control System). Nigel King, Senior
Software Consultant, SDI Group, “Wonderware object based technology, especially with the new embedded graphics capability, was a huge benefit to the successful completion of the project.”

Wonderware System Platform was designed with real-world project experience in mind where objects can be designed and rigorously tested and deployed repeatedly in multiple instances across the application. The WCS uses Wonderware System Platform and six InTouch HMI nodes for visualisation and supervisory control.

The system’s natural connectivity takes care of communications to automation controllers (mainly Beckhoff PLCs) and external databases. The Wonderware Historian provides History and Trend information. When the production facility matures, it will provide detailed insight into operational performance and provide useful information for continual improvement programmes.

Although SDI Group is a long standing Wonderware user, Nigel added, “We needed confirmation of our decision making and approach with the new version of Wonderware System Platform, Wonderware United Kingdom support staff and consultants provided knowledgeable and helpful guidance in both the initial learning curve and during the project’s execution.”

Return on Investment

SDI group delivered all of the requirements that were part of the project; these resulted in measurable business benefits that ensured early payback of the investment: The materials handling solution took just 10 months to be designed, installed and become fully operational. The project was completed within the required schedule with zero operational downtime. Increased Productivity resulted by an increase in available workforce equating to a headcount redeployment of 8 per cent.

Implementation

The installation was completed within the required timeframe, so Magna Automotive has been able to meet the delivery deadlines for new parts to its customer’s car production line. Zero downtime was achieved during the course of the design and build process, with no forced stoppages as a direct result of the project; this ensured that Magna Automotive was able to continue to serve its customer without disruption throughout the course of the installation.

On-Going Benefit

Notwithstanding the 2009 economic situation, Magna Automotive now has a far more efficient production system which will provide business benefits long into the future. The utilisation of the Wonderware System Platform will continue to provide measurable cost savings in operation and when inevitable changes to production occur.

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