

## Logistics boosted at Magna Automotive

Magna Automotive is a major supplier of components to the automobile industry, faced with increasing demand and the need to improve efficiency and quality they have totally re-vamped their manufacturing facility in Burton-on-Trent, UK. This was a major task that had to be undertaken whilst production was still running. Magna selected SDI Group UK to undertake this project for which Wonderware's System Platform provided the ideal solution in addressing the short time scales and in-project continuous improvements.

*“Wonderware’s object technology, especially with the new capability to have embedded graphics within an object in Version 3, was a huge benefit to the project time line.”*

*Nigel King, Senior Software Consultant, SDI Group*

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 basis with a four-hour notice period for incoming orders.

### The situation - increasing capacity with minimum cost

Whilst the operation only manufactures door panels for two vehicle models, there are a number of different variations for each because of different interior options that are offered

vehicle, which meant an increase in the number of variances of around 17 per cent. As a result, additional space was needed at the Burton-on-Trent facility to accommodate extra production equipment.

Magna Automotive wanted to identify the most cost-effective solution that met production needs for the customer. In addition, any project to redevelop the site was to be weighed against the anticipated transfer cost of moving the operation into a bigger vacant building located next to the current facility.

### Seeking at Solution

SDI Group UK was invited by Magna Automotive to design an automated system for the storage and retrieval of the injection moulded interior car door panels manufactured at the production site. A bespoke, 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.

SDI Group UK was also asked to consider a range of secondary requirements that included enhanced workforce productivity; maximising capacity for future business wins; and increasing operational visibility and control. In addition, any solution would have to take into consideration the unique needs of a just-in-time operation within the automotive sector, which demanded particularly high levels of accuracy, timeliness and product quality.

The facility had originally been built with a ten-metre clear eave height, yet the highest piece of machinery at the plant stood at only four metres high. Therefore around 60 per cent of



Magna Automotive with new mezzanine

to the consumer. Owing to a planned model change, scheduled for the first half of 2008, Magna Automotive was required to increase the number of panel variations to handle the requirements for both the outgoing and new



**Operator Station with Touch Screen PC**

the cubic volume of the building was unused and could be utilised to increase ground-level production space. With this in mind, SDI created the two-floor mezzanine structure measuring 1700 m<sup>2</sup> which has achieved more than 950 m<sup>2</sup> of additional production space to house new equipment.

Added capacity created by the mezzanine has enabled Magna Automotive to handle the increased number of product variations, and effectively achieve a maximum daily throughput of 1,330 completed door panels, made up of a total of 5,320 parts that are manufactured, stored and distributed within the facility. A dynamic storage area, capable of holding one and a half days worth of parts, transports manufactured items from injection moulding machines into a temporary storage area, before handling onward transfer to the production or secondary process areas.

This new solution replaced an existing process that used a ground-floor stock holding system that not only took up a significant area of available space within the facility, but also required staff to manually move parts between each stage of the production process. The removal of manual handling of parts between key areas within the manufacturing plant has enabled Magna Automotive to make best use of its workforce and redeploy resources to core areas of the production process. This has resulted in an increase in available resource of one site operative per shift, equating to a headcount redeployment of 8 per cent.

### The Solution – an improved Control System

The innovative WCS (Warehouse Control System) supplied by SDI Group UK has enhanced the overall control of the manufacturing plant and increased the ability

to better manage the site. Although not an original requirement, the sophistication of the solution has helped Magna Automotive to improve the company's stock control, production planning, and inspection of stock produced.

A key feature of the WCS is the easy to use touch screen operator interface using InTouch 10. 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.

In addition to the trolley loading operator interface, each PC node can display a full 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.

Also available to each operator are details of stock holdings by part and by location with 'drill down' comprehensive information. The details and destination of all trolleys moving on the conveyor system are also displayed in real-time. For any trolley an operator can call up a history of its movements around the system.

Away from the plant floor a 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.

Furthermore, it has allowed historical operational data to be stored and collated for reporting purposes, something that was previously processed manually.

### 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.

*"During the course of the design, build and installation process, SDI Group UK has become a valued member of our team. They have taken a responsive and flexible partnership approach to effectively manage a continually evolving project, delivering the solution within budget*

and in a timely manner.” Nick Towers, Magna Automotive

SDI Group UK designed a two-floor mezzanine structure that used a powered overhead conveyor system that would automatically move manufactured parts placed on trolleys with load hooks from the injection moulding machines (IMMs) into lanes located on a storage platform above the production areas. This ensured that these parts were stored until required by either production areas or drop-off points for secondary manufacturing processes, with each area fed via powered overhead conveyor on a one-to-one replenishment basis. Once parts were consumed, the emptied trolleys automatically transferred to a second mezzanine floor above the first-floor parts storage area until required at the IMMs.

A critical design challenge for SDI was to combat potential damage during the movement of parts between floors, which could affect the quality and integrity of the items. As a result, the use of incline and decline conveyors were ruled out to prevent increased movement between parts and avoid possible damage, meaning that some form of bespoke vertical lifting solution was needed to ensure parts remained suspended vertically. In total, five vertical lifts were used within the final design, strategically positioned to minimise the distance travelled between each area within the facility.

The installation utilised 250 specially-designed brush breaks to control and slow trolley running speeds on the storage lanes and unpowered parts of the system that relied on gravity. This innovative use of the brush break was particularly important because of the

varying weights of the different manufactured parts - ranging from 11 to 38 kilograms - resulting in a significant variation of trolley speed around certain areas of the solution.

An essential aspect of the solution was a sophisticated Warehouse Control System (WCS) that was developed to meet the precise needs of Magna Automotive. This user software would provide 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 WMS 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.

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.

### The core of the solution – Wonderware System Platform

For the real-time automation supervision of the system, the WCS (Warehouse Control System), SDI chose Wonderware’s System Platform. The choice was based upon long experience of Wonderware’s InTouch® HMI software and ArchestrA® architecture, the very short timescales and the predictable likelihood of changes and extensions to the specification when the project was being rolled out.

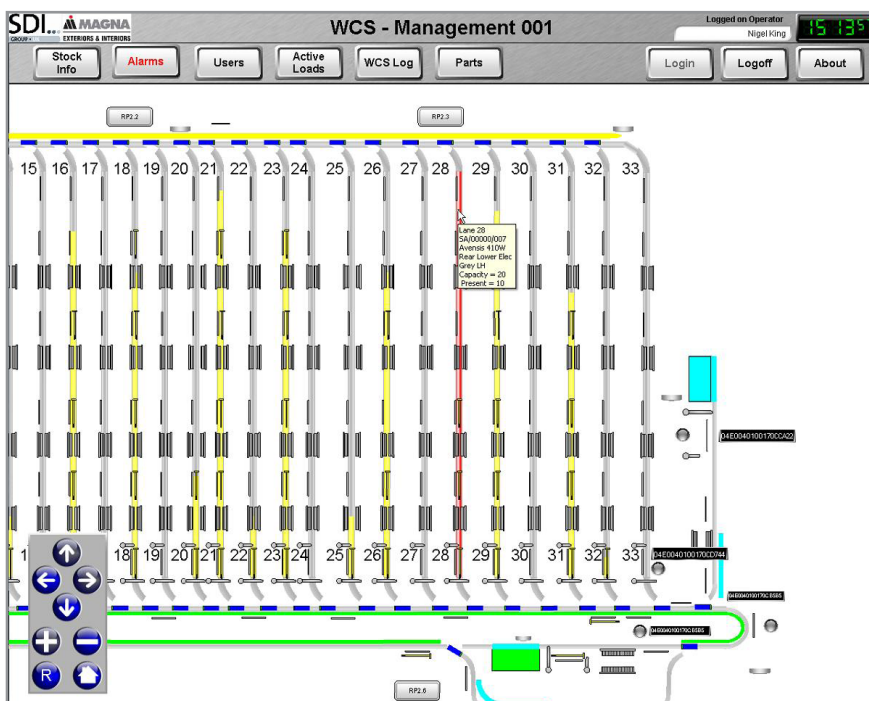
Nigel King, Senior Software Consultant, SDI Group, “Wonderware’s object technology, especially with the new capability to have embedded graphics within an object in Version 3, was a huge benefit to the project timeline.”

System Platform was designed with real-world project experience in mind, objects can be designed and rigorously tested, then an object ‘instance’ is deployed wherever an identical (or similar) item has to be automated. Changes are efficiently implemented in the master object, which automatically updates each instance. Detail within an object appears in a standard directory / sub directory structure; providing a clear usable overview and the ability to tailor an instance where a non-standard element has to be automated.

The WCS uses Wonderware System Platform V3 and six Wonderware InTouch 10 nodes for visualisation and supervisory control, the

*“We needed confirmation of our decision making and approach with the new version of System Platform, Wonderware UK support staff and consultants provided knowledgeable and helpful guidance in both the initial learning curve and during the project’s execution.”*

InTouch visualisation showing system alarm and pan and zoom controls



system's natural connectivity takes care of communications to automation controllers (mainly Beckhoff PLCs) and external databases. History and Trend information is available within the system which as the production facility matures will provide detailed insight into operational performance and therefore a sound basis for continual improvement programmes, above and beyond the significant improvements measured at the handover of the project by SDI Group.

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 System Platform, Wonderware UK support staff and consultants provided knowledgeable and helpful guidance in both the initial learning curve and during the project's execution."*

The InTouch nodes run on Advantech Touch Screen PCs that were supplied by HardwarePT – reducing risk by both hardware and software being supplied by the same company - SolutionsPT.

#### 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:

Improved Utilisation by freeing 1050 m<sup>2</sup> of additional ground-floor production space, increasing capacity to meet production needs and handle future growth. On-Time delivery, the materials handling solution took just 10 months to be designed, installed and fully operational, so completion within the required timeframe with zero operational downtime.

Increased Productivity by an increase in available workforce equating to a headcount redeployment of 8 per cent; combined with Enhanced Control such as improved stock control, production planning, and inspection of stock produced, as well as adding advanced, automated reporting capability.

#### On-going benefit

Notwithstanding the current economic situation at the time of writing (2009) Magna Automotive now has a far more efficient production system which will provide business benefits long into the future. The utilisation of Wonderware's System Platform in the solution by SDI Group will continue to provide measurable cost savings in operation and when inevitable changes to production occur.

*Wonderware UK wishes to thank the following companies for their valued contribution to this success story...*

#### MAGNA AUTOMOTIVE

Magna Automotive is a leading global automotive supplier with a diversified product and service offering. The company has approximately 84,000 employees in 241 manufacturing operations and 62 product development and engineering centres in 23 countries.

#### SDI GROUP UK

SDI Group UK, formerly SDI Greenstone is a leading provider of systems and solutions to the retail, wholesale, fulfilment and e-commerce industries for all aspects of distribution centre materials handling. As both consultants and systems integrators, SDI Group UK, is able to provide clients with a total logistics solution package which includes materials handling consulting, as well as design, engineering, fabrication, installation and integration services.

Contact SDI Group

Tel: +44 (0)1788 574666

[www.sdigroupuk.com](http://www.sdigroupuk.com)



© 2009 by SolutionsPT Ltd. All rights reserved. No part of this document may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), or for any purpose, without the express written permission of SolutionsPT Ltd.

Invensys, Wonderware, Archestra, InTouch and SCADAAlarm are trademarks of Invensys plc, its subsidiaries and affiliated companies. All other brands and product names may be the trademarks or service marks of their respective owners. Wonderware United Kingdom & Wonderware Ireland are trading names of SolutionsPT, an independent Wonderware software distribution partner. All rights reserved.

Contact SolutionsPT for information about software products for industrial automation.

SolutionsPT

Wonderware United Kingdom and Wonderware Ireland, Unit 1 Oakfield Road, Cheadle Royal Business Park, Cheadle SK8 3GX  
+44 (0)161 495 4698

[info@wonderware.co.uk](mailto:info@wonderware.co.uk)

[www.wonderware.co.uk](http://www.wonderware.co.uk)