

Plastic Omnium Uses InduSoft Web Studio to Track Assembly of BMW Bumpers, Fenders

InduSoft's ability to track parts through the production process gives BMW peace of mind, knowing it can order what it wants and see what was produced when, where and by whom.



The BMW X5 E70 sports activity vehicle is produced in Spartanburg, SC, using fender, bumper and trim parts assembled by Plastic Omnium in Duncan, SC.

InduSoft Web Studio:

- Chosen for its rapid learning curve and distinct design standards.
- Simplifies parts production management by multiple database connections that are flexible to meet your needs.
- Reduces human errors by reading 120 data points every 90 seconds.
- Can be deployed to any supported Microsoft operating system including HP servers, wireless handheld scanners and thin client terminals.
- Is a proven technology and has been working for Plastic Omnium since 2006.
- Boosts Plastic Omnium's confidence in providing BMW a seamless supply chain.

Background

BMW is an exacting customer that uses its knowledge base to build a reputation as a quality automotive manufacturer. When ordering bumpers and fender modules from Plastic Omnium's plant in Duncan, South Carolina, BMW wants to know everything about the parts including the vehicle identification number, build labels, color and even torque applied to the headlamp screw. And if there is a problem with the bumper, such as color, BMW wants to know the jig number, paint code and other details so it can track down owners.

To accomplish this, Plastic Omnium automation engineer Alan Cannon chose the InduSoft Web Studio software for use in a production control and tracking system. Cannon had to collect data from multiple sources (i.e. 16 different Allen-Bradley programmable controllers on the factory floor, N-Tron, TekLogix Workabout Pro handheld scanners and a wireless system from Cisco). Then, he had to integrate the



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system with several different databases including MySQL and Microsoft SQL server, eFORS, VB6, VB.net, and an SAP 4.6c ERP system. Finding the software user-friendly, Cannon and InduSoft application engineer Rogerio dos Santos had the system installed and running in two days.

Tracking System Requires Retrieving Information by VIN

The production process involves “assembling the front bumper skins with fog lamps, Parking Device Control with wiring harness, rear bumper modules and front fender modules,” said Cannon. Figure 2 illustrates a typical machine, a fender welder. “BMW required us to track the airbag serial number, plus the screw torque and angle for each assembled part. The system had to retrieve this information simply by entering the VIN.”

Figure 3 is a summary screen, listing the fender modules by VIN, scoop color and the number of fenders that the machine made on a shift.

This sounds simple enough, but it required multi-platform PLC (Programmable Logic Controller) communications and database connectivity. “It was hard to find a software package

that can connect to different PLCs and multiple databases,” says Cannon. Figure 4 shows the settings for the primary and secondary Server IP addresses, illustrating redundant communication paths from one of the machine control PLCs to InduSoft Web Studio.

InduSoft Meets Necessary Requirements While Maintaining Usability

Cannon found other software packages that might do the job, but he either did not like the operator interface or found the products “graphically challenging to comprehend”. InduSoft covered all the necessary requirements while maintaining usability. “When I choose a solution, I don’t care how much it costs. I’m looking down the road to the other users of the tool and how hard will it be for them to learn and use this?”

One of Cannon’s primary considerations when choosing software was:

Can we get on-site support in case of an emergency?

“InduSoft fit my requirements hands down,” says Cannon. “Control and automation engineers in general want to know that they can get support up front as well as after the sale. I’ve found most companies do well only on one side or the other but not both. InduSoft did well on both sides.”

Observable, lucid two-way communication made InduSoft the best fit for a seamless supply chain between BMW and Plastic Omnium.

InduSoft Web Studio Tracks Everything

The system collects data when front bumpers and fender modules are made, including:

- VIN numbers and build labels
- Color and jig number
- Torque and angle on the four screws on the headlamp
- Torque and angle on the screws for the airbag components
- Torque and angle on the screws for the wheel house liner

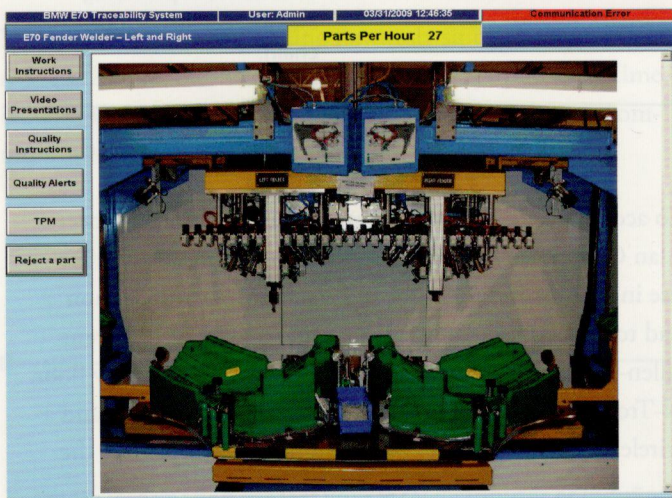


Figure 2: This fender welder is controlled by an Allen-Bradley PLC that reports to the InduSoft Web Studio software.

The [InduSoft] system has been operating flawlessly since 2006 and has reduced human errors in data collection, improved cycle time, reduced CNQ (cost of non-quality products), and made communications with BMW much easier.

— Alan Cannon,
Plastic Omnium Automation Engineer

ID	Event Date	VIN #	Scoop Color Number
15	03/06/2009	L1404483	04793C32WA35
16	03/06/2009	L1404483	05293C21WA475
17	03/06/2009	L1404503	21893C21WA62
18	03/06/2009	L1404513	21493C22WA62
19	03/06/2009	L1404523	21393C22WA62
20	03/06/2009	L1404533	21893C24WA62
21	03/06/2009	L1404543	21193R14L200
22	03/06/2009	L1404553	21793R14L200
23	03/06/2009	L1404563	17393R42WA62
24	03/06/2009	L1404573	21093R13L200
25	03/06/2009	L1404583	21393C21WA62
26	03/06/2009	L1404593	11993C14WA62
27	03/06/2009	L1404603	21493C17WA62
28	03/06/2009	L1404613	21493C11WA62
29	03/06/2009	L1404623	04993C22WA35
30	03/06/2009	L1404633	21393R13L200
31	03/06/2009	L1404643	11793C11WA62
32	03/06/2009	L1404653	05293R21L200
33	03/06/2009	L1404663	05293R21L200
34	03/06/2009	L1404673	05293R21L200
35	03/06/2009	L1404683	21793R51WA62
36	03/06/2009	L1404693	05293R21L200

Figure 3: Summary screen lists fender modules by VIN, scoop color and the number of fenders made on a shift.

InduSoft Web Studio (IWS) reads 120 data points every 90 seconds and stores them in a MySQL database. From this data, IWS can calculate:

- Cycle time monitoring per shift
- Cycle time monitoring life
- Total number of pieces per shift
- Downtime
- Where assembly modules are in the process
- Screens for quality information
- Total scrap
- Pivot tables

InduSoft Web Studio also interfaces to inventory databases so it knows what's needed to build parts that BMW orders. "Each type of module is contained within a part family," Cannon explains. "For example, the part screen (Figure 5) shows SEWV1M selected. This is a right hand front fender module part family. Here, BMW issued an order for one part with the module number being 4485555. In SAP we build a Master assembly list that contains all sub level 1 and 2 pieces required to produce this module. The InduSoft Web Studio screen also represents the sub level 1 and 2 components listed for this number, and it is essentially the same screen that SAP produces."

InduSoft Web Studio issues orders for employees to obtain the necessary parts and deliver them to the correct work station.

The settings screen displays various configuration options for the InduSoft Web Studio system. Key sections include:

- Database:** Configures the primary and secondary servers, including IP addresses, server names, user names, and passwords.
- PLC Communication:** Sets up communication with the PLC, including machine selection, driver name, and communication failure date.
- Dash Board Configuration:** Allows users to configure the dashboard, including shift selection, start/end times, and message display options.
- Environment Information:** Displays system details such as the operating system, free RAM, product version, and IP address.

Figure 4: A settings screen shows how each PLC connects to InduSoft Web Studio.

At any time, InduSoft Web Studio can produce a summary display of information from the last 24 hour period or last shift, including:

- Total parts produced
- Total AVG cycle times
- Total scrap dollars
- Total downtime in minutes
- Average parts per hour
- TRS MOD % of LH and RH fender assembly
- Machine OEE of LH and RH fender assembly

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The InduSoft System

The InduSoft Web Studio software is running on HP servers, which delivers regular web pages to operators on the factory floor via Microsoft Internet Information Services. Operators can access screens on touch-screen "thin client" terminals, which are placed throughout the factory.

Shop floor reporting was written in Excel which links directly to the database that machine reports to. The Excel spreadsheets are used by two departments – WCM (World Class Manufacturing Team) and Production Management – mostly wanting to see scrap and downtime reports. "I did these in Excel. Because their views requirements change so often, it was easier to let them change what they need than have me redesign them every two months," explains Cannon. "The higher-level functions, Stored Procedures and View Creations, are driven by the MySQL database."

Cannon also installed InduSoft Web Studio software in a diskless Windows CE system to serve as a warehouse management system. "I built the CE-based system to help track and find components within our system," he explains. "This application uses the same MySQL database and tables as the main systems use, and runs on Teklogix Workabout Pro handheld scanners. The scanners connect via wireless components from Cisco."

The system has been operating flawlessly since 2006, and has reduced human errors in data collection, improved cycle time, reduced CNQ (cost of non-quality products) and made communications with BMW much easier.

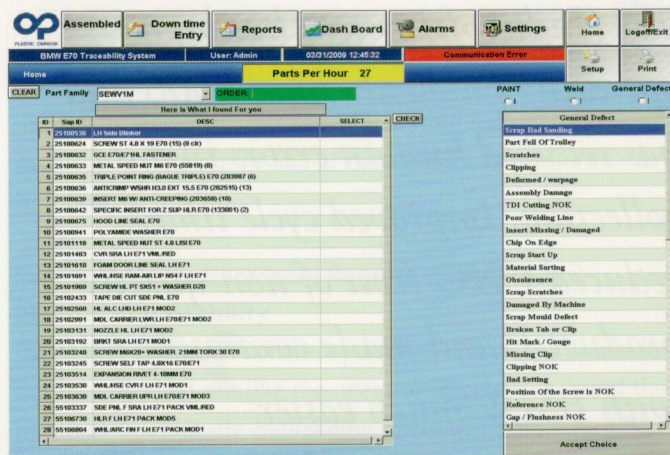


Figure 5: All the parts that go into making the right hand federal module are shown on this display.

For more information contact your local distributor or InduSoft directly at info@indusoft.com or 877-INDUSOFT (877-463-8763) or 512-349-0334.

