

# Automation Integrator Guide 2009

Directory of integrators: Over 1,750 entries searchable by industry, geography and product experience

System  
Integrator  
of the Year  
Winners



Supplement to

**CONTROL  
ENGINEERING**  
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**David Greenfield**  
Control Engineering

Automation system integrators are a diverse lot, but they can generally be described as engineering contractors that design and implement computerized control systems for their clients' industrial machinery, manufacturing lines, and automated production facilities. Examples include control, robotic, and test system integrators as well as automated machine builders and some multi-disciplinary engineering firms. Even a few of the automation industry's equipment vendors qualify as "system integrators," since they offer application engineering services to complement their product lines. That covers a lot of companies, from independent consulting firms to large multi-national engineering contractors. And we invited all of them to compete for System Integrator of the Year honors.

Scores of companies entered, but only three stood out as the best in their respective annual revenue classes: HiTech Control Systems (up to \$10 million in revenue category), JMP Engineering (\$10 to \$25 million in revenue category), and Brock Solutions (more than \$25 million in revenue category). These three system integrators best demonstrated their value in terms of technical expertise, business skills, and customer satisfaction. More information on their organizations follows.

Our panel of judges (see page 10) chose the winners and eight finalists based on portfolios submitted by each. Again this year, membership in the Control System Integrator Association (CSIA) and CSIA certifi-

cation figured prominently in the judges' decisions. All CSIA-certified integrators have demonstrated to a third-party auditor that they have—and use—established business procedures.

Overall, the judges were impressed by the dedication to customer satisfaction professed by so many of the entrants and demonstrated by their customers' testimonials. A desire to finish every job properly, as well as profitably, was a common theme. Several of the winners and finalists expressed a similar interest in keeping their employees happy, as well.

## The finalists

Following is a list of the finalists and their respective specialties. For more about these companies, see their listings in the directory portion of this guide, which begins on page 24 (or search online at [www.controleng.com/integrators](http://www.controleng.com/integrators)).

- Martin Control Systems—PLC and HMI programming and design.
- Insist Avtomatika—design, implementation and support of control and information systems for customers in oil and gas, metallurgy, and power supplies.
- Emerson Process Management—automation products and technology combined with industry-specific engineering, consulting, project management, and maintenance services.
- Tegron LP—plant consulting and information services, including manufacturing execution systems, component/material tracking, just-in-time, error proofing, lean principles, overall equipment

# Recognizing the *Best* in the **Busi**





# *Integrators* **ness**

Control Engineering proudly presents  
its 2009 System Integrators of the Year.

From left: Vivienne Ojala, Scott Shawyer, and Michael J. Shea represent their winning companies: Brock Solutions, JMP Engineering and HiTech Control Systems, respectively.

## ONLINE

A multi-parameter search will help locate the right integrator for you. Visit [www.controleng.com](http://www.controleng.com) to start your search.

efficiency, historian applications, and batch records.

■ **Maverick Technologies**—operational consulting and systems integration services that combine industrial automation, information technology, and asset reliability.

■ **Interstates Control Systems Inc.**—design, construction, programming, testing, and installation of custom plant-floor control systems for food and beverage, biofuels, and discrete manufacturing applications.

■ **Mustang Engineering Automation & Control**—control, automation, and information systems for the upstream oil and gas, refining, chemical, and manufacturing industries.

■ **Nova Systems Inc.**—system integration, precision motion control, and specialty engineering services for manufacturers involved with leather processing, metal spinning, heavy equipment, and medical equipment. **ce**

## HiTech Control Systems

Green Bay, WI

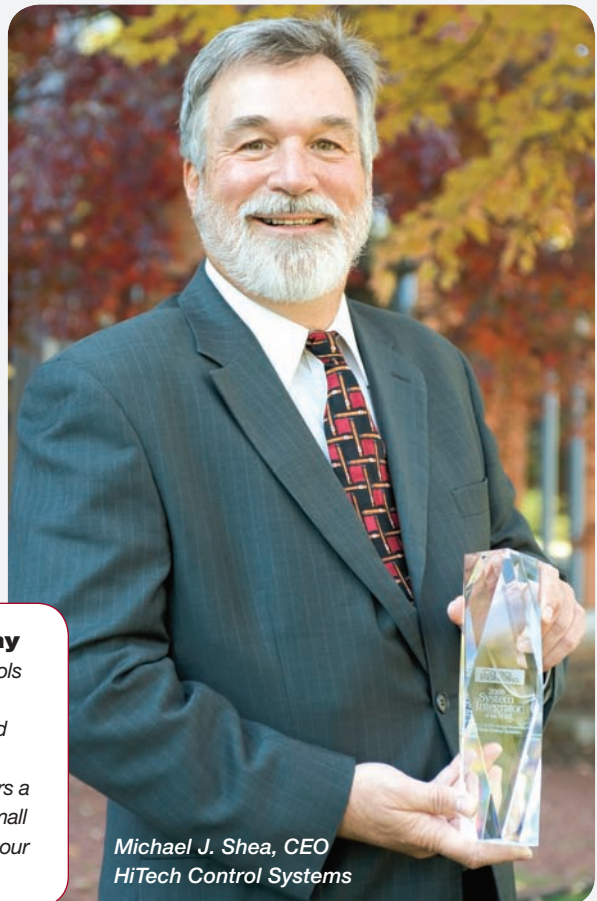
[www.hitech-inc.com](http://www.hitech-inc.com)

HiTech Control Systems, Inc. won in the up to \$10 million annual revenue category. The company engineers, integrates and delivers complete automation systems, including control and information systems, PLCs, SCADA, drives and vision inspection. The company specializes in the design and build of turnkey projects including custom machines, robotics, RFID systems and custom control panels.

HiTech serves many Fortune 500 companies by reducing costs, increasing reliability, and improving quality and safety. They can help a client develop a scope, budget, design, and schedule for a project, then implement the plan with the right combination of technology and technical skills. During their 23-plus years in business, HiTech has not allowed a project to fail. They have the in-house experience and expertise to know what it takes to get a project done.

Judge Tom Bullock was impressed with HiTech's policies and procedures, the diversity of their applications, and the number of degrees held by the company's personnel. He also noted that "they provided six excellent examples of stepping in to salvage a bad job" — a sure sign of exceptional technical proficiency.

Judge Vance VanDoren commented on HiTech's extensive collection of customer testimonials. "Not only has the company as a whole been recognized for its positive attitude and professional abilities, several individual contributors have been cited for serving their clients' needs above and beyond the call of duty."



Michael J. Shea, CEO  
HiTech Control Systems

### HiTech Controls — What one customer had to say

*"Your company assisted [us] in project management for a major controls project upgrade. We had four different major vendors plus various other vendors that needed to be managed to complete this project on time and within budget. We also needed to service our customers without any disruption in business. [We] operate seven days a week, twenty-four hours a day. So scheduling cutovers and shutdowns around this work was no small task. I am proud to say, we met all of our goals! I want to thank you and your company for providing a service that exceeded our expectations."*

# Gantry-Style Automated Accumulation

An integrator provides a custom automation solution to a partially manual production line, using robotics, touchscreens, and new controllers to manage backlogs between work cells.

**F**eed rates and material flow can be challenging with any automated line. Worthington Industries' plant in Wisconsin worked through those challenges recently with the help of robotics, new controllers, and touchscreens, among other integrated technologies. The company, a global supplier of pressure cylinders, produces LPG (liquefied petroleum gas) cylinders used to hold fuel for gas barbecue grills, camping equipment, hand-held torches, and other uses.

The Wisconsin plant had a conveyor line that ran between a valving station and a filling station. For the filling station to work effectively, a constant backlog of cylinders must be maintained. Multiple operators managed the backlog prior to the filling station by adding or removing cylinders manually to the main conveyor. When the filling station was unable to keep up with the valving station, the cylinders were manually removed from the line. When the rate of filling was greater than the valving station, the opera-

tors added cylinders to the production line.

Worthington Industries sought the help of HiTech Manufacturing Solutions Inc. in Green Bay, WI, which specializes in designing and building custom automation machinery. Scott Schroeder, HiTech project manager, worked on the concept for Worthington Industries, which led to HiTech being contracted to automate this manually intensive and repetitive process.

## Integration, few alterations

HiTech designed and built a gantry-style cell to maintain the necessary backlog prior to the filling station. HiTech's approach was cost effective, since minimal alterations were required to the existing conveyor and there was very little maintenance required.

The work cell used a two-axis Yamaha robot to load cylinders onto the production conveyor line, remove and accumulate cylinders from the production conveyor line, and add or remove cylinders as required. Accumulated cylinders are stored on plastic dunnage trays. The machine is controlled by a Rockwell MicroLogix 1500 PLC and Yamaha RCX222 robot controller. The operator interface is shared between an Allen-Bradley PanelView Plus 600 Touchscreen and the RCX222 Teach Pendant. A zoned safety circuit used light curtains, area scanners, door interlocks, and a pull rope, in conjunction with standard e-stop pushbuttons to safeguard the machine.

## Through the stations

There are five stations involved in the process. Each has a dedicated conveyor. The conveyors move the product and dunnage throughout the work cell.

- Station 1 (dunnage loading/unloading): A

*Shown is the loading of empty trays and unloading of full tray stacks. One surprise was the extent of stack height variation, the result of unforeseen pallet and tray height variability. Source: HiTech*



## ONLINE

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[www.hitech-inc.com](http://www.hitech-inc.com)  
[www.rockwellautomation.com](http://www.rockwellautomation.com)  
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*A Cartesian robot picks a row of bottles. The biggest machine design challenge was expected to be gripping a row of ten bottles on their necks and holding them square for placement on a tray, but that turned out to be easier than expected.*

*Source: HiTech*



reversing roller chain conveyor is used to move pallets full of dunnage into the work area (station 2) and to move pallets full of dunnage out of the work area;

- Station 2 (dunnage pick and place): A reversing roller chain conveyor mounted to a scissors lift is used to move pallets with dunnage into the dunnage loading/unloading station. The scissor lift is used to maintain a consistent height of dunnage for the vacuum pick and place between station 2 and station 3;

- Station 3 (loading/unloading cylinders onto production conveyor): A roller conveyor with a pop-up roller chain conveyor is used to make a 90-degree transfer; this conveyor is mounted to a scissor lift used to move pallets with cylinders from station 3 to station 4. The scissor lift is used to maintain a constant elevation of the cylinders for the pick and place between station 3 and the production conveyor. When the production conveyor requires cylinders, the overhead gantry picks up 10 cylinders from station 3 and places them onto the production conveyor. If excess cylinders are being accumulated on the production conveyor, the gantry will pick up 10 cylinders from the production conveyor and move them to station 3;

## Quality, throughput

**“The automation upgrades provided Worthington with a more effective use of labor... improved quality and increased production,” said Gary Rano, Worthington Industries operation manager. Team members were proud to overcome project challenges, he added.**

- Station 4 (pre-staging/accumulation of pallets with cylinders for station 3). The roller conveyor, with a pop-up roller chain conveyor transfer mounted to a scissor lift, is used to move pallets with cylinders from station 4 to station 3 and from station 3 to station 4. This station is capable of holding one pallet full of cylinders for accumulation.

- Station 5 (loading of pallets with cylinders for station 4): A forklift operator loads or unloads a pallet full of cylinders at this station. A roller chain conveyor is located at this station.

HiTech's solution required dunnage that held 120 cylinders (10 across and 12 deep). The gantry has a dual head end effector. The front side of the end effector has a pair of grippers capable of picking up 10 cylinders (one row) at a time. The back side of the end effector is capable of picking up an empty dunnage tray with vacuum.

“The biggest challenge in designing this machine,” Schroeder said, “was gripping a row of 10 bottles from the conveyor on their necks and holding them square for placement on a tray. Gripped bottles would then be placed along the side of rows of product already on a tray. Any out-of-square bottles would hit existing bottles on the tray and create a jam.”

## Resolving variability

Unexpected challenges arose during startup and commissioning with the variability in tray stack heights. Variability in heights of the wood pallet and five to six tray layers caused inconsistent picking of bottles from a tray and placing them on the product conveyor. During the picking of bottles, the gripper would grip the neck higher or lower because of the pallet and tray height variability. This would cause the bottles to drop or push bottles onto the conveyor surface while reloading the conveyor line. It became evident that flexible gripper bars were required to account for the stack height variations. Approximately an inch of float was added to the gripper bar to allow for picking and gripping of bottles at a consistent height on the neck thus dropping them off at a fixed height.

In custom automation, one-of-a-kind machines there are always unexpected challenges, said Schroeder. “It’s how you deal with these things to achieve the same end result” that provides an advantage along the way, he said. **ce**

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