DSI Innovations
Relentless. Reliable....Relax - we've got this!

CASE STUDY


# STREAMLINED BATCH PROCESS CONTROL: Delivering Efficiency And Accelerated Production To A Chemical Plant's New Reactor Train

*DSI delivered a Batch Control System for a chemical plant, transitioning from manual to automated operations compliant with ISA S88 standards. The project featured design, specification, and installation of process equipment, leveraging Rockwell and Ignition software for control and insights. This integration facilitated enhanced production efficiency, reduced human error, and provided a user-friendly interface, signifying a leap in automated batch processing while ensuring key features like advanced reporting and operational support were highlighted.*

## ABOUT DSI

DSI Innovations is the premier building automation, machine, process, discrete and data automation company.

Our exceptionally experienced teams of systems developers are led by the industry's most outstanding team leaders and project managers. Their intimate knowledge of what it takes to complete projects and handle every detail allows us to tackle your toughest challenges head-on.

We relentlessly execute with constant communication throughout your projects, and stand with you until the job is fully completed per your expectations. And then our meticulously reliable (24/7) field service team is there to insure minimal downtime and maximum corporate profitability.

## THE CHALLENGE

DSI was tasked with delivering a fully automated Batch Control System for a chemical plant's new Reactor Train. The existing reactors were manually operated, and the aim was to establish a streamlined, user-friendly, automated control system following the ISA S88 batch control standards to minimize human error and be operable by staff without prior experience with automated systems. The project involved P&ID design, hardware specification, supplying field devices, panel fabrication, installation support, Factory Acceptance Testing (FAT), commissioning services, and startup support.

The new process equipment included a batch reactor, two pre-mix tanks, three raw material/catalyst mix tanks, and manual addition scales. DSI was also tasked with designing a custom-built Conex for the MCC/electrical room and a new control room equipped with multiple monitors and operator stations, remote touch screen interfaces, and Class 1 Division 2 wireless tablets for operators and maintenance personnel.

## THE ACTIONS

DSI utilized their knowledge of production and product expertise for the creation of an automated batch production system. They set up the system using Standard Operating Procedures (SOPs) and used Rockwell Automation hardware and software for advanced control, interface, and reporting. The integrated Rockwell applications included FactoryTalk SE Network for the operator interface, Thin Manager/Client, and FactoryTalk Batch software.

During the design phase, DSI created detailed functional specifications based on Process & Instrumentation Diagram (P&ID) and knowledge of batch control systems. For procurement and testing, they organized and delivered instruments, valves, and field devices in a trailer to serve as an on-site instrument shop for the project. They also designed and procured a Conex shipping container pre-installed with the necessary server and control equipment.

The batch control process and reporting used Ignition software to provide insights into the process, display dynamic trend graphs on Microsoft Edge, and generate PDF reports on cycle times and material consumption.

System commissioning began with validating field devices, testing PHA safety interlocks, and testing process control sequence logic. During the testing phase, DSI started with water batching and then testing with actual raw materials after five weeks. On-site support and system handover included providing support to make necessary adjustments and resolve issues before officially handing over the completed system to the customer's operators. DSI also offered ongoing support through their remote hotline service.

## THE RESULTS

Successful system commissioning and Integration validated the functionality of various field devices, safety interlocks, and the accuracy of the process control logic. This demonstrated the seamless integration of the new system into the existing infrastructure.

The control system's functionality displayed advanced capabilities in controlling the reactor, tanks, and mixers. DSI's commitment to project execution and design fulfillment ensured that the system met the detailed specifications and adhered to the final Process & Instrumentation Diagram (P&ID). Efficient batch production and testing rapidly achieved qualified material production within five weeks of commissioning.

Operational handover and ongoing Support transitioned the system to the customer's operators and ensured continuous access to expert assistance. Modular design and future proofing facilitated future retooling and development.

This project represents a significant advancement in the client's automated batch processing, attributed to meticulous planning, cutting-edge technology, and a phased approach that ensured thorough testing and efficient implementation.


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