Chemical Industry Solution
Reaction Application

Realize faster time-to-value benefits, lower life cycle costs and higher lifetime business value

Benefits:
• Maximize yield
• Improve product consistency up to 5%
• Improve transition performance up to 50%
• Increase maximized production capacity by 4-8%
• Minimize use of energy, catalyst, and/or feedstock per ton

The Challenges
Chemical companies are constantly facing significant challenges to produce high quality product alongside rising material costs and increasingly stringent environmental requirements. Along with increased competition, many companies are faced with the question of just how to flourish in these conditions. In order to remain competitive in the marketplace, manufacturers must find solutions that can overcome these challenges and best optimize business operations to produce prime product at the demand level customers require.

Process control is a vital component in producing prime product in the reactor. Controlling the reactor process is key for manufacturers to produce prime product yield, reduce off-spec product, increase capacity, and thus succeed in the competitive marketplace.

Rockwell Software recognizes these challenges and offers an application focused on delivering valuable reaction control for optimization and performance.

Rockwell Software Solutions
Our solutions leverage 100+ years of Rockwell Automation Chemicals innovation, experience and global support. Industry best practices are incorporated into every application, which is built upon a composite application framework that leverages a Service Oriented Architecture (SOA). This scalable solution, when combined with library-based content, offers personalization options that promote faster user adoption and time-to-value.
Manipulated Variables
Reactant Flows
Temperatures
Pressures
Catalyst Flow

Disturbance Variables
Feed Flows
Feed Types
Composition

Controlled Variables
Conversion/Severity
Partial Pressure
Effluent Composition

Model predictive control (MPC) technology plays a critical role in a demand-driven manufacturing environment.

Reaction Application
The Rockwell Software Reaction Application assists in controlling and optimizing the reactor process. Powered by Rockwell Software patented technology, this application is tailored to the individual configuration of each unit and specific site objectives.

Application Scope
Powered by Pavilion8 technology, the Rockwell Software Reaction Application is customized to the individual configuration of each reactor or unit within the reaction process (i.e. furnaces, CSTRs, fixed-bed, fluid bed, etc.) The application controls feed rate, temperatures, pressures, and reactant flows as appropriate to the reaction to reduce variability of key parameters (i.e. conversion, partial pressure, reactant ratios, etc).

Control
Improved control of the important reaction parameters inherently increases product yield and capacity. The Reaction Application leverages sequence control to codify best practice procedures, thus preventing significant upsets during the start-up and shut-down process. Reactor sequence control essentially automates what is an important, but highly manual process, thereby reducing the risk of human error and production halts.

Complete Solution
The Reaction Application includes fundamental and engineering knowledge to provide complete solutions within the reactor, and ensure chemical companies meet their business objectives more successfully.

Performance Metrics and Visualization
Real-time visualization in a browser-based interface presents metrics that allow operators and management to monitor the performance measures of production, quality and energy. These dashboards allow current and predicted plant performances to be viewed and managed to realize and sustain the lifetime business value of MPC investment.