

# Global Solutions

Turbomachinery control expertise



LISTEN.  
THINK.  
SOLVE.®

 Allen-Bradley • Rockwell Software

**Rockwell  
Automation**

# Proven Control Technology and Application Expertise

Increasing competitive pressures in the process industries have driven dramatic changes in the operational needs of process plants, utilities and pipelines. Faced with the ongoing need to reduce start-up time, increase turbomachinery cycles, and get the most out of your assets, with less money and fewer people, is a challenge.

Rockwell Automation has the hands-on experience and a wide range of successful installations amassed over the years and has supplied thousands of turbomachinery control systems around the world.

With our coordinated turbomachinery control systems you can achieve optimized train control which helps efficiency, reducing the time and costs required to support and maintain the system.

In addition, the Rockwell Automation solution helps:

- Improve unit stability and responsiveness
- Operate closer to the control limits, increasing production
- Prevent surge, overspeed and associated damage
- Automate startup and shutdown
- Provide improved operational flexibility and increased plant performance
- Provide a concise view of key turbomachinery parameters



# integrated solutions

# Fully Integrated Turbomachinery Solutions

## Worldwide Leader

As a worldwide leader in the field of high integrity automation systems, our portfolio includes designing and building some of the largest systems used in gas plants, refineries, petrochemical plants, offshore, subsea, pipelines and other similar production facilities. With over 40 years' experience in safety and turbomachinery (TMC) control systems, Rockwell Automation will design and implement controls for your most demanding applications.

Fully integrated solutions provide you with a host of user benefits to increase productivity, performance, protection, and ultimately profitability, throughout the whole project life cycle.

## Maximize Your ROI

The success of your business relies on the ability to achieve the most out of your turbomachinery assets. Rockwell Automation has the products and people to give you the competitive edge and maximize your Return on Investment (ROI). Our systems control turbine machinery precisely, helping to increase efficiency and reliability, and save money and energy resources.

## Total System Responsibility

Our dedicated global team of professionals can assume responsibility for an entire package, including compressor/turbine control specification, project management, system design and manufacture, test, start-up, commissioning, training and continued support.

## Review of the Entire Train

Our approach to interactive turbomachinery control includes the study of the entire process/pipeline, from the compressor to the driver to the surrounding process. Each solution is adapted to your requirements to achieve precise and efficient operations.

## Technology

From small self-contained products based on industry standard hardware, to large-scale plantwide systems in simplex, redundant or Triple Modular Redundant (TMR) platforms, we offer versatile turbomachinery solutions. Whether your application is a small steam turbine governor, a large turbine-driven compressor train, or an entire process plant, Rockwell Automation has the right size solution.



# Compressor and Turbine Control Features and Benefits

## Compressor Control

### Advanced surge control

Operating point tracking, look-up table curve fit, adaptive gain, etc., all contribute to the ability of safely operating the compressor close to the surge limit line.

### Incipient surge detection/control – SurgeGard™

SurgeGard detects the instabilities that occur as a precursor to surge. The incipient surge detection is independent of the compressor performance map. SurgeGard provides for a wider operating window, permits close operation to the actual surge line, identifies/corrects shifts in the surge line and facilitates surge point testing.

### Integrated process/capacity control

Standard solutions offer coordinated action between performance control and anti-surge control. Simple selection of capacity control type (suction pressure, discharge pressure, pressure ratio, flow, etc.).

### Load-sharing optimization

Combination of equal-distance load balancing and load optimization results in maximum load share efficiency.

### Fallback algorithms

Allows for continued operation in the event of a critical transmitter failure (critical transmitters include flow, suction pressure and discharge pressure).

## Turbine Control

### Turbine speed control

Fast processing time allows the turbine governor functions to be incorporated into the control system simplifying hardware providing a totally integrated solution.

### Turbine overspeed protection

Integrated yet segregated overspeed protection for your turbine increases uptime and simplifies hardware. Up to nine independent speed inputs and six discrete outputs provide overspeed and over acceleration protection for your turbine train.

### Automated start-up, sequencing and shutdown

Startup/shutdown sequences, process interlocks, purge and warm-up cycles can be incorporated and coordinated between stages/sections, and the process. The process can be put on-line quickly and consistently.

### Auxiliary controls

Lube and seal oil systems, process auxiliaries and safety interlocks can easily be incorporated into the system.

### Process interlocks

Communications between control and machinery protection applications within our solutions are easy to establish and with capacity for thousands of I/O points process interlocks are easy to implement.

### Control strategy flexibility

Extensive library of control functions allows to add a custom-defined strategy and to adapt to field conditions.

# advanced control

# Total Range of Turbomachinery Controls

Rockwell Automation turbomachinery control not only enhances established rotating equipment control, but also offers benefits for turbomachinery automation applications.

Our pre-engineered application configuration is at the leading edge of control and information technology – technology that incorporates both familiar and strikingly new concepts. The functionality of these concepts is shown by outstanding performance despite being hidden by the pre-configured application simplicity.

The flexibility of this turbomachinery automation system allows for the integration of many types of applications:

## Centrifugal/axial compressor control

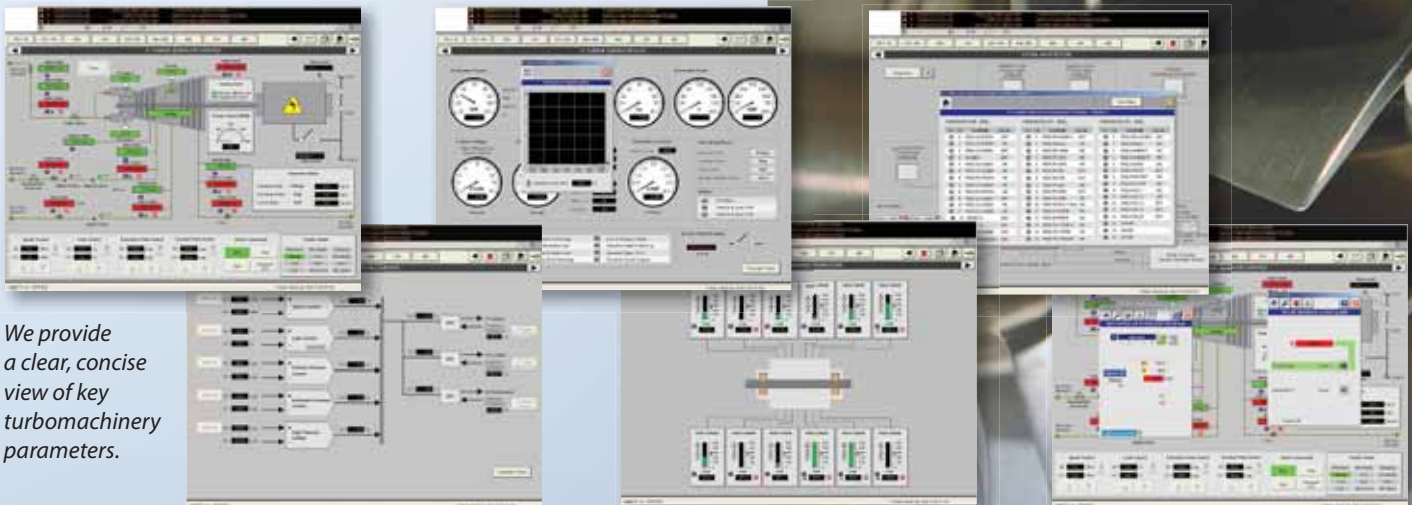
Anti-surge control, load sharing and optimization, process decoupling and capacity control for turbine and motor driven machines.

## Steam turbine control

Speed control, startup/shutdown sequencing, critical speed avoidance, overspeed protection, extraction flow or pressure regulation.

## Gas turbine control

Single or multi-shaft, fuel control, startup/shutdown sequencing, temperature control, machine protection, including Fire & Gas.



*We provide a clear, concise view of key turbomachinery parameters.*

# Fully-Integrated Control for the Entire Turbomachinery Train Maximizes Reliability and Efficiency of Turbomachinery and Process

## Complete Integration

A completely integrated solution offers you improved performance control, better information visualization and asset condition monitoring, as well as flawless interface with the general process control (DCS, PCS, SCADA) and information systems.

## Range of Technology

With multiple control platforms, we can recommend the one most suited for your needs based on standards and your application requirements. We offer a full range of options from pre-engineered package solutions for simple compressors and steam turbines to the systems solutions for an entire turbomachinery train.

## A Total Solution

From consultancy services and startup assistance, to taking responsibility for specialist sub-systems supplied by others, Rockwell Automation is the comprehensive source for your turbomachinery automation needs.



reliability

## System Panels

For turbomachinery control systems mounted in freestanding cabinets, choose from pre-configured system panels or small packaged solutions. Both help reduce engineering and maintenance costs, increase reliability of operation and reduce lead times due to full “turnkey” responsibility.

Rockwell Automation can provide the detailed requirements you need for each phase of your project.

## At Your Service

An integral part of every solution is dedication to customer services, such as:

- Project management
- Complete system design
- Start-up and commissioning assistance
- Comprehensive problems diagnostics
- Factory and on-site training

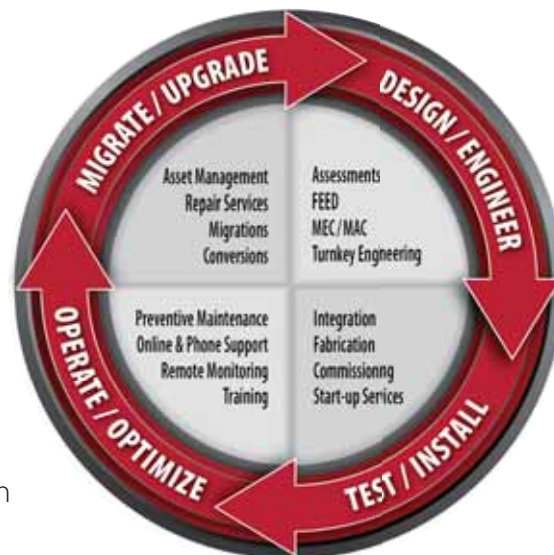
You can count on excellent turbomachinery control solutions and outstanding customer service.

expertise

# Bringing You a World of Experience Through Solutions & Services

Your business has complex challenges. But your ultimate goal is likely a simple one: to run a profitable, safe and sustainable operation. Reaching that goal is easier with Rockwell Automation at your side.

Our aim? To provide your organization with the solutions and services you need to maximize production throughout your automation lifecycle – from design and installation through operation and migration.



## Delivering Value – and Confidence

When you work with Rockwell Automation, you engage a supplier focused on listening to you – and learning about your issues and objectives. Then, we apply our domain expertise, global execution ability and certified project management methodology to help you create and execute innovative solutions that meet or exceed your business goals.

Our know-how spans a wide range of industries and includes complete solution delivery capabilities that complement and enhance our product offerings. Whether your automation challenges are centered on discrete, process or safety control, drive systems, energy management, information or sustainable production, we will draw on our in-house expertise and collaborative resources to deliver repeatable, scalable and maintainable solutions on time and within budget.

In addition, we will assess your entire operation and recommend the right mix of services to help increase productivity, optimize plant assets and improve overall financial performance across your enterprise.

Offerings include:

- Asset Management
- Consulting & Assessment
- Engineered Packages & Panels
- Integration & Turnkey Services
- Main Automation Contractor (MAC)
- Maintenance & Repair
- Migration Services
- Online & Phone Support
- On-Site Services
- Project / Program Management
- Systems Design
- Training

Know that you can rely on our team to provide a full scope of capabilities to deliver the solutions and services you need – both now and in the future.

Allen-Bradley, Listen. Think. Solve., Rockwell Software, SurgeGard and Installed Based Evaluation are trademarks of Rockwell Automation, Inc. Trademarks not belonging to Rockwell Automation are property of their respective companies.

**[www.rockwellautomation.com](http://www.rockwellautomation.com)**

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846