To run a profitable, safe plant or offshore facility, you need a single integrated plantwide solution, one that addresses the issues you face every day. Rockwell Automation’s PlantPAx is just such a solution. Whether you’re migrating from an existing DCS solution or building a brand new greenfield facility, PlantPAx is the answer.

**PlantPAx solutions help you:**
- Maximise productivity
- Reduce total cost of ownership
- Minimise life cycle costs
- Increase safety for your people, plant and the environment

PlantPAx represents a new generation of integrated, scalable solutions for large control, safety and power systems – solutions that exceed control and safety functionality typically found today. A PlantPAx solution integrates process, power, safety and critical control in a single unified platform and offers you unprecedented levels of control, and flexibility:
- System tools that enable configuration in a common environment
- A single, integrated database and common tag structure to simplify engineering
- A library of reusable control objects to shorten project development time

**Flexible, Scalable, Fault-tolerant Architecture**

Recognising your need for greater flexibility and scalability, PlantPAx was designed to integrate easily with existing systems, and can be tailored to your requirements - from small numbers of I/O to thousands of I/O - in a variety of configurations. Helping you increase productivity and lower your cost of ownership.

PlantPAx solutions offer redundancy at all levels – from power supplies, I/O and processors, to networks, servers, databases and HMI devices. They allow automatic synchronisation, bumpless switchover after failure, and online failed component replacement.

**Common Systems Infrastructure**

PlantPAx elements share a common infrastructure that facilitates consistent information and visualisation for users:
- Security Management identifies, authenticates and authorises user access, minimising breaches.
- Data access creates a ‘publish and subscribe’ environment for real-time data access.
- Diagnostics communicate activity, status and warning messages throughout the system.
- Audits manage and record system changes.
- Activation provides secure, centralised software licence management.
- Alarms & Events display a common, consistent view.
Integrated Architecture

Control
Advanced Control
Safety
Turbo-Machinery Control
Condition Monitoring
Power Monitoring
Motor Control
Drive Systems
Package and Unit Control

Integrated Information

Real Time
Data Historian

Integrated Visualisation

Alarms & Events
Control
Safety
Trending
Production
Maintenance

Integrated Asset Performance Management

Process Device Management
Security
Change Management
Disaster Recovery
Process Control

At its core a PlantPAx solution consists of an engineering development environment, system wide visualisation and multi-disciplined process controllers. This core can be sized for small single-unit applications or scaled up for large highly-distributed multi-train systems.

Built on Rockwell Automation’s Integrated Architecture™, PlantPAx process control seamlessly integrates multiple components, including advanced process control, safety, Motor Control Centres™, drives and Turbo-Machinery Control.

High performance PlantPAx controllers give you processing power to control many loops. Object-orientated, explorer-based, drag-and-drop configuration lets you build complex functions with ease.

Faceplates associated with every instruction help you set-up, tune and monitor control loops with a minimum of effort. In fact, all equipment – from pumps and valves to compressor trains – can be controlled and managed using standard faceplate objects.

Global objects technology lets you create your own reusable libraries of process control and visualisation objects. So you can control a process area, trace all events related to it and manually or automatically tune the control loops. Adding further functionality, such as access to the operational manual or alarm and fault-handling procedures, is easy.

There’s more. Additions and modifications can be made online, while your process keeps running. The system supports all IEC61131-3 programming languages. Plus every controller features a tag-based, real-time database that integrates seamlessly with software applications.

PlantPax solutions offer a wide range of local and distributed I/O, and process network connectivity options – giving you design and installation flexibility. The core system also integrates with digital field devices such as HART™, Foundation Fieldbus™, Profibus PA™ for process instrumentation, and EtherNet/IP for industrial control devices. Distributed I/O is also available for Zone 1 and 2 hazardous areas.

Technology

With PlantPax, process control is built around Rockwell Automation’s ControlLogix® platform, delivering high-performance processing and information management in an easy-to-use environment. ControlLogix combines discrete and process control for drives, motion, safety and communications, with state-of-the-art I/O, in a small, cost-effective package. Its modular approach lets you improve design productivity with performance ranging from basic digital control to high-speed compressor anti-surge solutions.

ControlLogix benefits:
- High-speed, high-performance multidisciplined control (sequential, process, drive and motion)
- Fully-redundant architecture for bumpless switchover and high availability
- Wide range of communication options with analogue, digital and specialty I/O
PlantPAx – Process Safety & Critical Control

A profitable plant keeps production levels high without endangering personnel, assets or the environment. High availability PlantPAx solutions integrate safety with critical process control to protect all assets. In addition to new solutions, we also offer well-defined migration paths for legacy systems that minimise upgrade costs and asset down-time.

PlantPAx technology is based on more than 40 years of expertise in safety and critical control solutions for the oil and gas industry. Our offerings include such diverse applications as Subsea, ESD, F&G, Turbine and Compressor, Blow Out Preventers, HIPPS, Combustion Control and CPC solutions that protect people, assets and the environment.

Choose from a range of scalable solutions to satisfy your requirements for safety, performance, integration, availability and costs:

- TUV-certified SIS and critical control solutions
- Scalable solutions meeting SIL 1, 2, and 3, including fail-safe and fault-tolerant offerings
- Diverse or common components
- Segregated or fully integrated implementations

Safety and Control Technology

ControlLogix®

ControlLogix® process controller has been certified by TUV for use in SIL 1 and SIL 2 applications, in accordance with IEC-61508. An Integrated Control and Safety System based on this common hardware platform is also available.

Trusted™

Our Triple Modular Redundant (TMR) safety and critical control product, uses RunSafe™ 3-3-2-0 fault-tolerant control. It reduces spurious trips, while offering the highest availability and lowest cost of ownership of any SIL 3 rated safety system. Certified to SIL 3 by TUV, Trusted is NFPA 72, 85 and 86 compliant.

AADvance

AADvance safety and critical control solution complements and seamlessly integrates with the PlantPAx environment.
This distributed architecture offers one of the highest levels of flexibility and scalability in the industry - from small quantity I/O to large centralised or distributed. It’s certified SIL 1 to SIL 3 and fail-safe to multiple fault tolerant configurations.

AADvance’s modular, scalable architecture lets you configure a system as simplex, duplex or triplex, at the processor and I/O levels, while supporting SIL 1, SIL 2 and SIL 3 safety loops, concurrently.

Unsure of your SIL targets? AADvance lets you start at the lowest-cost, lowest-SIL solution. With simple cost-effective upgrades taking you to higher SIL levels - on a loop-by-loop basis if necessary - as your design progresses.
Advanced Process Control

Every day, oil and gas producers face increasing pressure to reduce costs, increase yields, and leverage existing technology. PlantPAx Advanced Process Control (APC) can help you address those needs. Our Pavilion MPC modular software platform, for example, can help you reduce total cost of ownership through Model Predictive Control (MPC).

As a supervisory control application, Pavilion MPC continuously assesses current and predicted operational data. By comparing this data with desired targets and trajectories, it computes new controller set points to achieve your desired results.

MPC enables productivity improvements by continuously driving the process towards optimum performance. By combining control and optimisation in the same architecture, Pavilion MPC applications can maximise production rates and yields, minimise off-spec production, and meet other economic optimisation criteria - while satisfying all process constraints, such as emissions limits and energy consumption. Models from individual production units can even be combined to develop a multi-unit optimisation model, providing interactive “What if?” scenarios to optimise plant performance.

Robust process models are critical to the performance of any MPC solution. Pavilion’s unique hybrid-modelling uses empirical models built from historic process data and fundamental models from first-principles equations in model development. This approach delivers high-fidelity, computationally efficient models for prediction, control and optimisation that are valid across the entire process operating range.

Technology

- Patented hybrid modelling approach for highly accurate models of complex processes
- Single architecture combines control and optimisation
- Unique parametric controller design handles linear and nonlinear models simultaneously
- Dynamic models offer fixed or variable parameters for more consistent operation through transitions
- Browser-based user interface gives easy access to adjust targets and constraints
- Built-in controller metrics continuously monitor utilisation, efficiency and performance

Other APC technologies in PlantPAx include Internal Model Control for control applications with significant process delays and Co-ordinated Control, where multiple outputs are available for Control, Modular Multivariable Control and Fuzzy Logic.
Compressor and Turbine Machinery Control

PlantPAx turbo-machinery controllers are built to meet your automation needs. From anti-surge control for single-stage compressors to multi-stage unit control, we adapt each solution to your requirements to ensure precise and efficient operation. All have the control power and architecture to match your application.

Rockwell Automation PlantPAx process offerings include the industry’s most dependable Turbo-Machinery Control systems. With nearly a half century of experience in critical control, we’re uniquely qualified to design and implement Turbo-Machinery systems for the most demanding applications.

Our turbo-machinery controllers provide superior compressor and turbine control. No other automation solution combines advanced control, operator interface and configuration in such a value-based package. PlantPAx TMC controllers are proven in a number of applications including Gas and Steam Turbines, Compressors, Gas Expanders, Pumps and Mechanical Drives.

Features include:

- Speed Governing
- Temperature Monitoring
- Overspeed Avoidance and Protection
- Vibration Monitoring
- Extraction Control
- Surge Control
- Patented Incipient Surge Detection
- Process Control
- Efficiency-based Load Sharing
- Automatic Voltage Regulation
- Generator Protection
- Load Management
- Power Management
- User Friendly HMI

Technology

Rockwell Automation PlantPAx provides an integrated family of Turbo-Machinery Control products that deliver unmatched performance. Systems are available on our dedicated Turbine and Compressor controllers, on our ControlLogix platform and on our Trusted and AADvance controllers. That means you can choose a platform to meet your specific safety, availability and fault tolerance requirements.
Condition Monitoring and Protection

PlantPAx condition monitoring systems improve the reliability of your plant’s machine systems by constantly measuring their health - helping you prevent system breakdowns, avoid unplanned shut downs and optimise maintenance resources.

Dynamix™ condition monitoring and machinery protection products are fully integrated with PlantPAx, offering API 670 compliant machinery protection, online surveillance monitoring, walk-around portable data collection, sensors, and analysis software.

Dynamix online systems serve the protection function for machines, from simple motor-pumps to the largest turbo-machinery in any facility. They provide operations and maintenance with critical machinery health information, while leveraging standard plant information, control and visualisation systems.

Technology

XM® Machinery Protection and Condition Monitoring Systems offer machinery protection, while providing real-time diagnostic and condition monitoring data.

Protection. API 670 compliant machinery protection system offers a full range of measurements, with analogue (4-20mA), buffered signal, relay and digital communications outputs.

Intelligent. Dynamix systems not only provide data, they have the processing power to locally calculate order magnitude and phase values, static and orders-based frequency band values, and other measures. These can identify faults which may be alarmed via static or speed-specific alarms, and applied to voted logic for local or remote relays.

Integrated. Open network design for easy bridging to almost any plant network architecture.

Scalable. The rugged, modular, scalable distributed architecture allows modules to be installed near machinery, reducing signal wiring and reducing costs.

Sensors. Our 2100 series non-contact pickups and 9000 series accelerometers are rugged, reliable API 670 compliant sensors, certified for hazardous areas.

Enpac 2500 Z2 and Enpac EX. These combination portable analysers and data collectors are rated for hazardous areas. The Z2 model has options for simultaneous 2-channel data acquisition, balancing, time waveform recording, start up and coast down, as well as FRF. Both comply with IP65 and 2 meter drop test ratings.

Emonitor. This condition monitoring software supports archiving, automated diagnostics, statistical alarming, plotting and reporting of data from any Dynamix data acquisition platform. It fully integrates with the PlantPAx information environment.
Intelligent Motor Control

Achieving world-class standards for plant availability requires minimising downtime from unplanned shutdowns and repair. By retrieving diagnostic data from your plant’s electric assets, PlantPAx solutions can anticipate problems and take pre-emptive action - a critical component for a successful high-availability strategy.

Rockwell Automation’s Intelligent Motor Control architecture is an integral part of the PlantPAx Control System. It simultaneously supports plant control strategies, while facilitating the remote configuration and maintenance of motor control devices.

Leveraging best in class technology for industrial communication, this architecture seamlessly integrates diverse devices across the same communication backbone used for Process Control and Plant Information Systems.

Centerline™ intelligent low-and-medium voltage motor control centres, and PowerFlex™ low voltage and medium voltage variable frequency drives, are easily integrated into process controllers, providing simultaneous and independent access to engineering workstations for asset management applications. Rockwell Automation’s power products offer plug-and-play connectivity through communications interfaces via DeviceNet™ and ControlNet™.

Intelligent Motor Control solutions leverage the control, communication and information technologies available in the PlantPAx Control System, offering a significant reduction in installation costs (network vs. hardwiring) and commissioning time (pre-wired, pre-tested and pre-configured).

These integration features can be scaled down to smaller clusters of motor control devices, such as equipment skids, allowing for plant wide integration.

Benefits:
- Easy access to diagnostic data from any connection point across the Communication Backbone, without disrupting control functions
- Faster, simpler configuration of Control and Visualisation strategies via pre-defined communication profiles, customised instructions and visualisation templates
- Increased productivity, with specific control algorithms such as Pump-Off for oil wells.
- Increased electrical safety, with certified design and construction features such as arc flash protection
- Reduced operator interaction through remote diagnostic capabilities
- Data from Intelligent Motor Control devices can be cross referenced against process variables, supporting asset performance management strategies

Technology

Rockwell Automation Intelligent Motor Control solutions are fully scalable, for applications ranging from individual motors to complete process control systems. Typical solutions integrate drives, intelligent relays, motor control centres (MCCs), sensors and other monitoring devices in a common data-driven communications network, delivering precise motor control intelligence.
Integrated Information and Visualisation

Real-time information exchange is critical to making real-time business decisions – decisions that improve responsiveness, increase productivity, reduce costs and assure regulatory compliance. With Rockwell Automation’s PlantPAx integrated suite of scalable, modular software applications, you have access to all the information you’ll need to configure, control and optimise production.

PlantPAx surpasses typical DCS functionality, meeting your system, control and plant-wide information needs from a globally distributed database. With its integrated information and visualisation, you can reduce start-up times, minimise downtime and optimise production efficiency.

Operator Workstation
Our user friendly interface provides an operator with all the tools necessary to operate the plant - with high resolution graphic displays tailored to your specific needs.

- Single or multiple monitor displays
- Consistent interface, with navigation buttons and alarm banners
- One-click access to alarm summaries
- Easy access to real-time and historical trending
- Multiple language support
- User based security

Alarm Management
Our Alarm and Event management approach helps you react to problems more efficiently.

Features include:
- Real-time alarm management
- Controller-based time-stamping for Sequence of Event analysis
- Alarm suppression
- Alarm filtering by Process Resource and Operator Role
- Operator flexibility in display preferences

Data Historian
Developed through an alliance with OSIsoft Inc., PlantPAx historian fully integrates data acquisition and world class historian technology. It benefits from the features of OSIsoft’s PI, an Oil and Gas industry standard.

With Rockwell Automation PlantPAx you can maximise your ability to collect time-series data and access historical information at any time, across different levels and tiers of your process. Providing access to historical data, with reporting and playback tools to empower situation analysis from process and safety condition data.

Our data management infrastructure combines production data, and alarms and events across the distributed PlantPAx architecture. Key features include:

- Performance equations
- Totalisers that archive
- An advance calculation engine with recalculation capabilities
- Data Access Server technology (ODBC/OLE/OPC)
- Redundant historian servers for high availability

Data Historian has been designed around a multiple user scenario. Operators can view individual trains and the complete platform in real-time, to build comparisons and assess how production is running. Having multiple entry points to data helps you make faster, more accurate decisions.
Portal
PlantPAx Portal gives you a high-level window into your production process, providing core portal services such as role-based access to applications and data. Portal can also integrate with collaboration, security and extended search systems from other vendors.

Plant Data Visualisation
Decision support tools allow end-users to self-configure Web-based dashboards, trends, and reports. It leverages PlantPAx service-oriented architecture to deliver automatic access to production information from both Rockwell Automation and third-party systems.

It reduces the cost and complexity associated with the maintenance and improvement of your production operations. It does this through data aggregation, visualisation and reporting, delivering information from every level of your process:

- Monitors overall asset production
- Provides role-based data visualisation
- Determines performance of individual machines or process trains

Web-HMI
The PlantPAx ViewPoint thin client application, built with Microsoft Silverlight technology, extends visualisation to browser-based remote clients. ViewPoint software supports fully-scalable, animated displays of existing operator graphics.

Technology
- Federated data model empowers discipline-level management of condition data
- Proven connectivity to third party systems
- Full connectivity with low integration costs
- Data compaction and time-based storage
- Real-time reporting and data analysis ability
- Role-based reporting and access
- Reduced Life Cycle costs
- Accelerated integration

PlantPAx System
Control Loop Performance Monitoring

PlantPAx System
KPI Dashboard
Asset Performance Management

Oil and gas producers need improved performance from every asset they own. Our Asset Performance Management tools align operations personnel and maintenance personnel, to achieve just that – the maximum value from your production assets. Our solutions facilitate data aggregation, work flow emulation, role-based visualisation and automated performance analysis, empowering you for success.

PlantPAx serves as the foundation and information source for Asset Performance Management, giving you asset-focused tools to securely and centrally manage your production environment.

Its fully scalable design secures access to your control systems, tracks users’ actions, manages asset configuration files, and provides backup and recovery of operating asset configurations.

- Change Management governs security, configuration and archiving of control asset information
- Process Device Management configures and calibrates process instruments
- Disaster Recovery supports all assets and devices.

**Configuration Management** of process devices is based on FDT/DTM technology, and supports a wide variety of process instruments and field devices through plug-in drivers (DTMs) from device manufacturers. This assures online access to device configurations, troubleshooting tools and diagnostics.

**Calibration Management** keep process instrumentation current by:

- Scheduling calibrations
- Managing calibration standards
- Managing certifications
- Documenting “As Found/As Left” status
- Calculating permitted tolerances
- Performing paperless calibrations.

**Benefits of PlantPAx Asset Performance Management Solutions** include:

- Standardised risk mitigation and change management procedures
- Comprehensive diagnostics and device configuration
- Calibration and real-time monitoring
- Audit operator actions and device health

**Technology**

- Federated data model with uniform tag structure
- Live data presentation for simpler aggregation in real-time
- Discipline-driven data management
- Predictive model technologies for analytics
- Role-based reporting with web technology
- Work flow emulation and data management tools
- Change management and audit trail tools
- Calibration management tools
- Security and audit trail
Device configuration and management tools
A Single Solution. A Single Network

Imagine a single solution enabling all of your technologies to communicate through one integrated network, in one language. That’s what you get with PlantPAx process automation - a transparent flow of information.

With PlantPAx, you can choose the one network that best fits your application, or mix multiple networks. That’s because EtherNet/IP, ControlNet, DeviceNet and PlantPAx all speak a common language, the Common Industrial Protocol (CIP).

The result is a single, integrated platform, delivering simplicity, efficiency and reliability. Which means that instead of running different control systems for different technologies - and increasing your risk of error- PlantPAx manages everything from a single source, helping you increase performance and profitability.

Lowest Installed Cost

Our experience designing reliable, space-saving, simple to use solutions benefits you too. Helping to reduce your engineering and integration costs, while improving productivity. Small wonder that Rockwell Automation PlantPAx solutions have the lowest installed cost in the industry.

Lifetime Support

The benefits don’t stop there. As a global company with offices worldwide, Rockwell Automation offers you local access to a service and support infrastructure that’s second to none. Our engineering teams are experts in their fields, and have years of experience designing and installing integrated systems against tight timescales and flexible goals.

We pride ourselves on providing customers with the highest level of support, throughout the lifetime of your products - and beyond. We can support you through the entire process, from initial consultation through installation and on-going maintenance.

With people and programmes committed to helping you optimise business performance. From assessment services to asset management. From remote monitoring to repair. And from on-site training to telephone support to remote services.

- Global emergency support 24/7
- Offices and agents in more than 80 countries
- 3500 distributors and agents
- 1,000 service engineers, consultants and project managers worldwide

Whether you’re around the corner or around the world, our service and support network is nearby, with the skills and resources to optimise the performance and utilisation of your automation equipment. And help you meet your business objectives.

Let Us Be Your Automation Partner

In your fast-changing, competitive world, there’s no substitute for experience. Rockwell Automation has a successful track record of focusing optimisation solutions on the issues oil and gas producers confront. Our in-depth understanding of the policies and requirements affecting your industry can help you reduce business risk, improve operational efficiency and achieve faster time to market.
For more information, call a Rockwell Automation sales office or distributor today. Or visit us online at http://www.rockwellautomation.com/industries/oilgas/
**Integrated Information Systems**
- Maximise ability to collect time-series data and access historical information
  - Proven connectivity to third party systems
  - Real time reporting and data analysis ability
  - Role based reporting and access

**Compressor & Turbine Machinery Control**
- Superior compressor & turbine control
  - Helps protect against surge & overspeed
  - Automates startup & shutdown
  - Improved operational flexibility
  - Increased plant performance

**Condition Monitoring & Protection**
- Monitors the health of your system
  - Improves reliability
  - Helps protect from unplanned shutdowns
  - Optimises maintenance resources
Intelligent Motor Control
- Seamless integration of different devices
- Access to diagnostic data from any connection point across the communication backbone
- Faster & simpler configuration of control & visualisation strategies
- Increased electrical safety & productivity

Distributed Process Control
- Centralised or distributed
- HART, Foundation Fieldbus, Profibus PA
  - Built in and user defined process control objects
  - Advanced process control strategies

Safety & Critical Control
- High availability, high reliability
- Fail safe to multiple fault tolerant
- Non-safety to SIL3
- Distributed or centralised
- Small quantity I/O to large systems

Asset Management
Optimises maintenance and plant operations to improve resource availability
- Complete change management for the control system
- Complete audit of all system assets
- Asset optimisation
- Security

Model-based Predictive Control
- Enables production unit productivity improvements
- Automated asset health monitoring
- Quality optimisation
- Maximum value capture from the production unit