

Plant Automation and SCADA Solutions

for the Water & Wastewater Industries



Experts in Water and Wastewater Treatment

Emerson Process Management Power & Water Solutions, Inc. is the premier source of proven control technology and application expertise for the water and wastewater industries.

We are known and trusted throughout the world for delivering superior control and operational solutions for water and wastewater facilities of all sizes. As part of Emerson Process Management, we combine our technology and experience with a broad range of instrumentation, valves, actuators, and other products and services to offer our customers the most comprehensive, knowledge-driven approach to improving performance.



Go with the flow

Is your current process flooded with inefficiency?

By choosing Emerson, you are selecting innovative plant instrumentation and control solutions that ease the flow of information for efficient plant operation.

Solutions Overview

Install an Emerson control system at the center of your water or wastewater treatment process, and you'll achieve the industry's most reliable and cost-saving process control.

Emerson offers system-wide solutions for water and wastewater infrastructures that include industry-specific capabilities such as Ovation™ remote SCADA applications, embedded advanced control, predictive maintenance, and optimization solutions.

With Emerson, you won't just meet regulations and achieve environmental compliance—you will achieve a cost-effective, district-wide solution that ensures reliable, efficient control today and into the future. Moreover, your control network will be expandable, so you can meet the increasing demand for a clean water supply. With Emerson's long-term support programs, you can ensure that the installed system is maintained and upgraded as needed for continued maximum reliability and efficiency.

It Works Better Together

Emerson stands out among the competition because of our complete, plant-wide automation solution. We're comprised of the most widely implemented instrumentation and control products and solutions, including Rosemount™, Fisher™, Mobrey, Bristol™ ControlWave™, Ovation™, and DeltaV™.

Realize the full potential of your plant automation technologies by standardizing on Emerson products and services. Our process management brands are designed to work together for superior results. Our award-winning Ovation and DeltaV control technologies, in combination with AMS Suite and Emerson's digital instrumentation, make up the heart of the PlantWeb™ digital plant network.

PlantWeb enables superior diagnostic capabilities through the integration of predictive maintenance practices. Ultimately, PlantWeb's network of predictive intelligence enables you to detect process and equipment problems even before they occur, so you can move from reactive to proactive and profitable management. That's something no one else can promise.



Solutions from Emerson manage more than 12 billion gallons per day of treatment capacity.

A Digital PlantWeb Architecture

Emerson's PlantWeb digital network delivers reduced project risk and better operations. From a centralized workstation, you'll have access to comprehensive data and real-time predictive and preventative information concerning measurement and process devices and mechanical equipment. A PlantWeb solution doesn't just provide more data — it offers actionable information, validated at its source to ensure reliability.

Data Management and Reporting

Emerson's data management and reporting capabilities offer effective monitoring and control to detect and isolate system leaks better. We provide integrated information flow to monitoring systems such as LIMS (laboratory information systems), FIS (financial information systems), and GIS (geographical information systems).



Proven Capabilities



Strength and Stability

When executing critical projects, you need to know that the partners you select are strong and stable, and will continue to be a solid corporate presence far into the future. Emerson has a long history of designing, implementing, and supporting water and wastewater treatment plant control technologies. We have an unparalleled history of growth and success, even in years characterized by a lean business cycle. Our clear technology leadership and fiscally stable operations make Emerson the logical choice to design, engineer, and support your water and wastewater treatment plant projects.

Project Management Capabilities

Successful project execution requires an experienced, global team of industry experts, project managers, and lead engineers who know how to successfully apply these technologies to your specific business and industry.

Emerson's water and wastewater team of highly skilled support personnel are dedicated to designing and implementing innovative automation solutions. Made up of individuals averaging 20 years of experience, our team includes custom application engineers, instrumentation tech-

nicians, RTU and PLC programmers, SCADA and telemetry experts, graphic designers, schedulers, program managers, process optimization specialists, and many others.

Design Engineering Services

Emerson implements industry-standard best practices to achieve success within the constraints of a complex project. Through conception, development, and implementation, highly experienced Emerson project managers work closely with you to provide high-quality design engineering services in the following areas:

- Specification development
- Design review
- Controls strategy
- Standards development

Emerson can provide a total, district-wide solution that includes front-end engineering design, equipment selection, and commissioning services. Our project management and engineering expertise offers a single point of accountability for the entire instrumentation and automation system, making the critical difference when the pressure is on. Extensive experience with hot-cutover installation and commissioning can help keep operations running without interruption.

“Emerson’s field engineers were extremely accommodating and very knowledgeable. Everything was done with our schedules in mind, thus affording us the time to do what was required to keep the plant operating efficiently 24 hours a day, seven days a week.”

Douglas Jackson, P.E.

Manager, Electrical and Control Systems Engineering, Allegheny County Sanitary Authority (ALCOSAN)



Lifecycle Management Services

We want you to realize the lowest system lifecycle costs possible. To help you achieve this, Emerson stays with you long after your project has been completed through programs such as asset optimization and long-term maintenance and support.

We offer an array of support modules through our award-winning SureService™ and Ovation Evergreen customer

support programs and our asset optimization services. These programs help you to maintain healthy operations and enable you to leverage today’s digital technologies for predictive and preventative maintenance. Whether it is a reliable, error-free startup or extending the usable life of your equipment, Emerson helps you to realize a better return on your investment.

A recent independent study placed our customers’ satisfaction with our customer services at better than 97%.

Application Experts



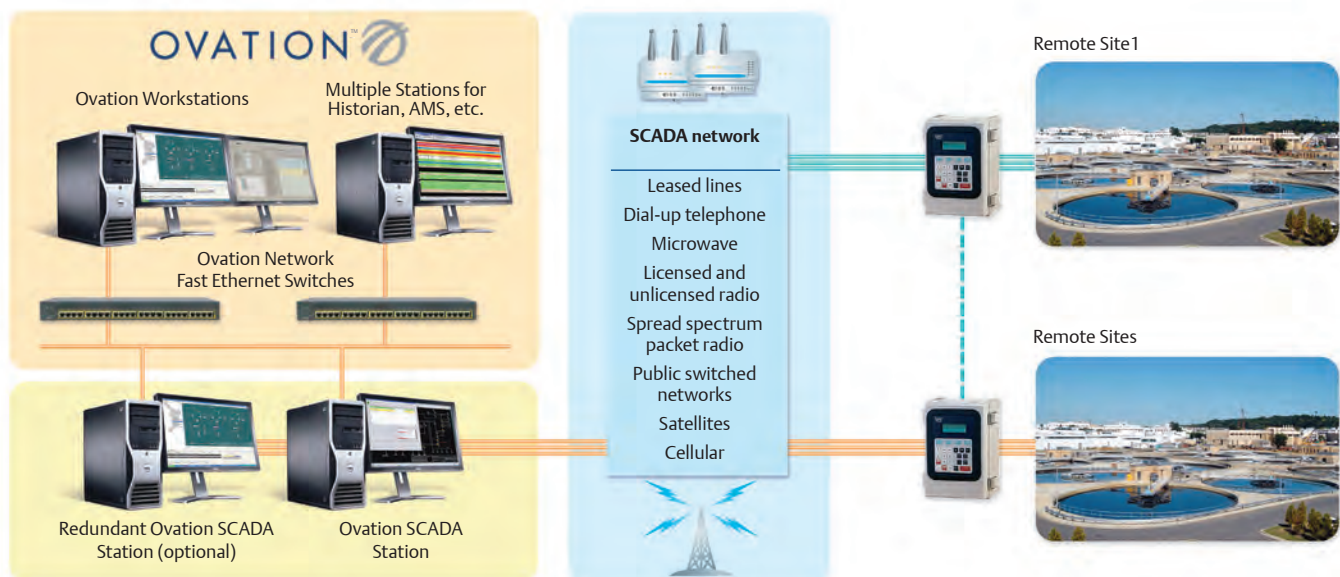
Innovative SCADA Solutions from Emerson

Emerson's Ovation SCADA communications server effectively monitors and controls the activity of remote water and wastewater systems from a single location. With Emerson's plant automation and control strategies, you experience safer, more reliable control over treatment processes spread over hundreds of miles. Implemented as either a standalone server or incorporated with Emerson's control technology, Ovation SCADA solutions ensure accurate data collection and continuous

operation. Our expert SCADA control technology is applied in numerous applications, including:

- Automated, unattended operations
- Lift stations
- Pump stations
- Radio survey and design
- Remote operations
- Remote telemetry units
- Security functions
- Sewer diversion
- Wastewater collection
- Water distribution
- Water distribution and collection
- Water irrigation systems
- Water reclamation
- Weather monitoring
- Wet weather overflow protection

Expansion and Growth





Plant Controls & Monitoring Systems

Our solution allows you to unify your process, plant, or entire district into a single, powerful network of control and monitoring for a variety of applications. We offer:

► **Wastewater treatment controls** for primary and secondary treatment, clarifiers, solids thickening, digestion, dewatering, incineration, sludge pumping, and advanced treatment such as microfiltration, UV, and RO.

► **Water treatment controls** for raw water pumping, coagulation and flocculation, sedimentation, dewatering, recycling, filtration, disinfection, and chemical treatment.

► **Equipment condition monitoring**, including online and portable vibration monitoring, motor diagnostics, infrared thermography, laser alignment, and oil analysis.

► **Smart instrumentation and bus technologies**, such as fieldbus solutions for HART, Foundation fieldbus, PROFIBUS® DP, and DeviceNet, as well as AMS Suite: Intelligent Device Manager and AMS Suite: Machinery Health Manager software for fieldbus-based devices.

► **Remote automation technologies**, such as Emerson's Bristol™ ControlWave™ solutions, offer local control, low power consumption, wide temperature ranges, environmental suitability, and wireless, wide-area network communication.

Security

Emerson addresses many levels of security concerns, such as machine authentication, stringent password management, workstation hardening, and disabling prohibited activities as well as more streamlined and formal user permissions. Physical security, including intrusion detection via infrared motion detectors, key-lock entry, remote video, and vehicle tracking can be integrated into our remote automation solutions.

Comprehensive Enterprise Integration Strategies

Emerson leverages our broad portfolio of expertise, technologies, and the PlantWeb architecture to develop a customized solution that enables customers to realize the benefits of integrating real-time process and equipment information with transaction-based enterprise business systems.

With Emerson's industry-focused enterprise solutions, our customers can experience operational flexibility, improved reliability, increased operating efficiencies, and environmental

and regulatory compliance — which translates into increased financial strength and allows you to reallocate your budget to where it is needed most.

System management and optimization services include district-wide integration, pump optimization, energy management, enterprise historian and report generation, asset management, and reliability programs, remote integration of collection systems, and interfaces to LIMS, CMMS, GIS, CIS, security systems, and plant design databases.

Three Layers of Enterprise Integration

Process Automation – Emerson delivers asset optimization, process control, and management execution through our PlantWeb digital plant architecture.

Plant Management – Emerson ties in predictive maintenance, performance analysis, and optimization applications through the AMS Suite and SmartProcess™ Optimization software.

Enterprise Management – Emerson integrates process automation and plant management systems with the customers' other information systems, including maintenance management, laboratory information, plant design, or financial information systems.



Benefits of Superior Control

Wastewater Solutions

System Management and Optimization

- System-wide integration (multiple plants)
- Enterprise historian and report generator
- System-wide asset management and reliability programs
- Interface to LIMS, CMMS, GIS, CIS/FIS, plant security systems, and design database

Plant Controls and Monitoring Systems

- Distributed control system (HMI, controllers, network, etc.)
- Advanced treatment: microfiltration, UV, RO
- Plant historian and report generator
- Electronic documentation
- Integration with other systems and intranet/Internet
- Fieldbus solutions (HART, Foundation fieldbus, PROFIBUS, DeviceNet, etc.)

Simulation

- First-principle simulation
- Algorithmic simulation
- Tie-back simulation

Equipment Condition Monitoring

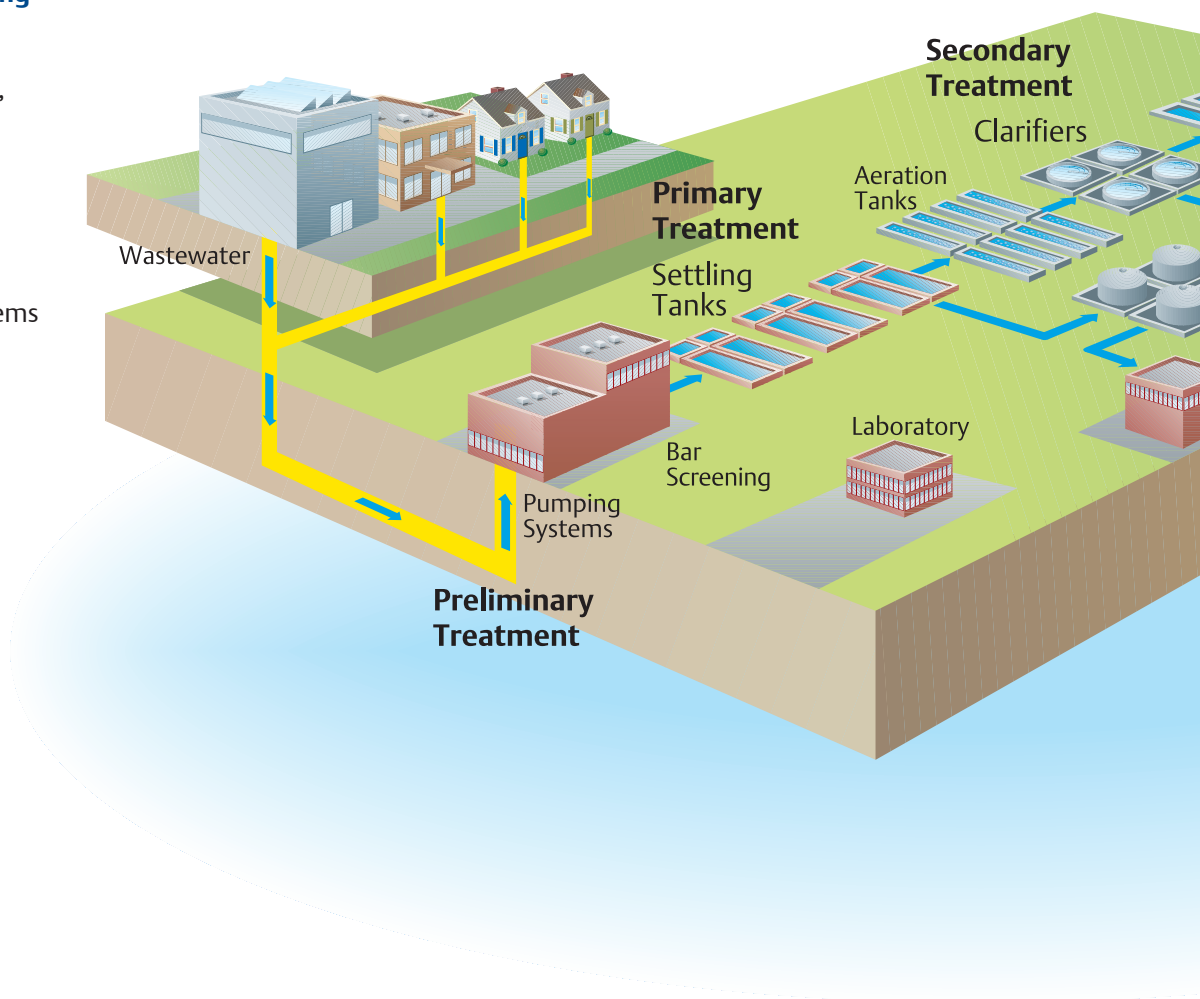
- Online/portable vibration monitoring
- Motor diagnostics
- Infrared thermography
- Laser alignment/balancing
- Oil analysis

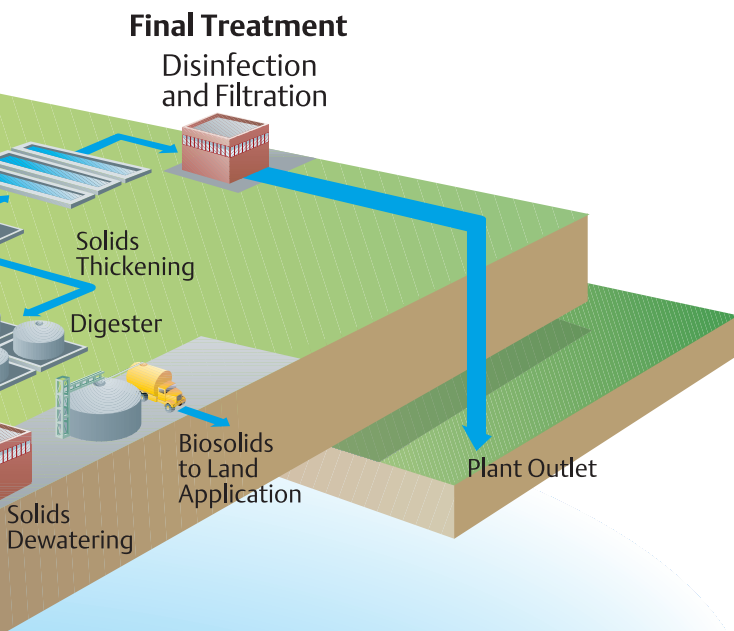
Intelligent Device Management

- Health monitoring
- Calibration
- Configuration
- Audit trails

Intelligent Field Devices

- Pressure, temperature, flow, and level transmitters
- Liquid/gas analyzers
- Valves and valve actuators





Electrical and Auxiliaries

- UPS, power conditioning, and distribution
- Motors
- Couplings
- Gear reduction drives
- Backup power generators

Engineering Services and Lifecycle Support

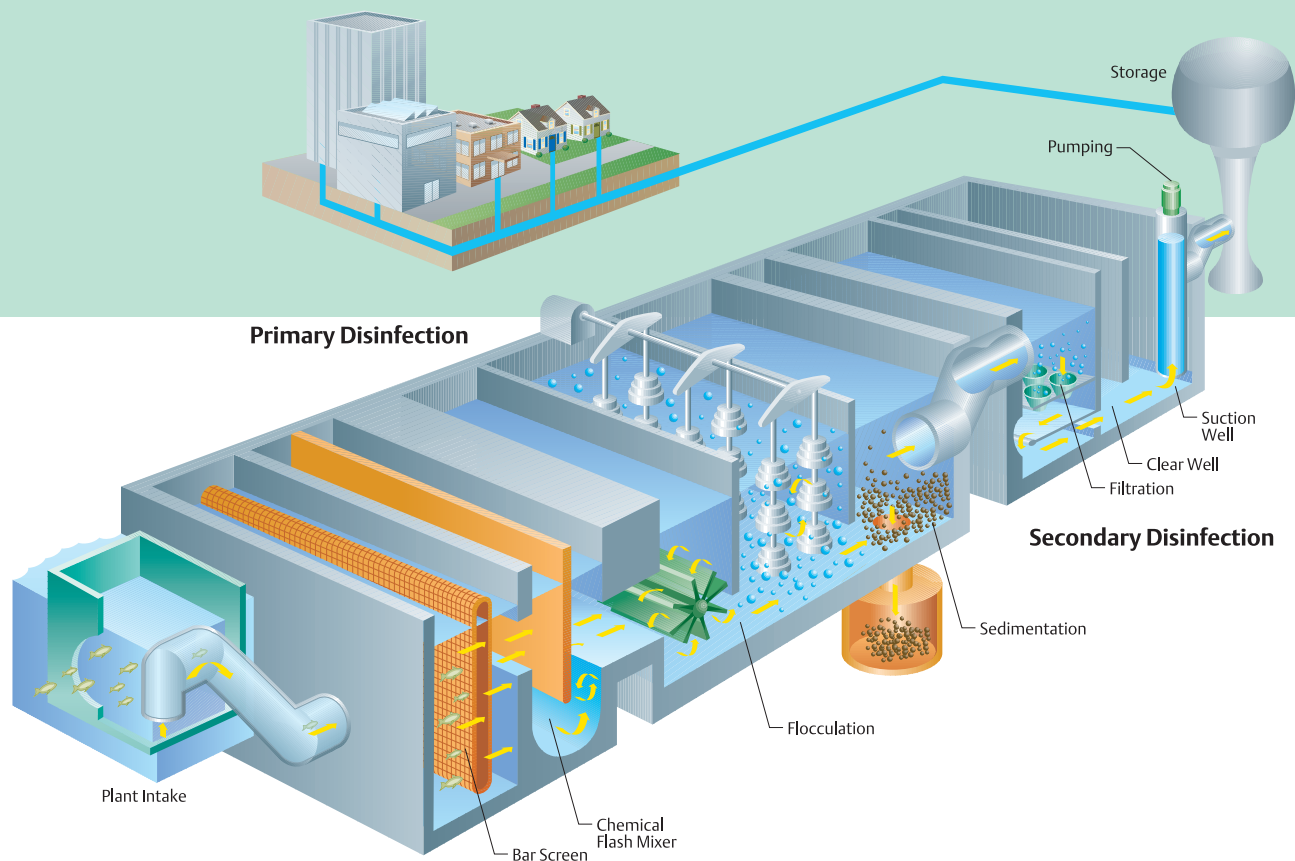
- Front-end engineering and design (FEED) capabilities
- Installation, commissioning, and startup services
- Long-term maintenance
- Support, reliability, and maintenance services
- Optimization programs
- Educational services
- Integration services
- Security assessments
- Instrumentation maintenance

SmartProcess

- **Economic Optimization**
 - Minimizes costs
 - Reduces equipment wear and tear
 - Balance trade off in time of day pumping strategies
 - Energy management
 - Optimizes pump and chemical usage
- **Global Performance**
 - Monitors and benchmarks equipment performance against design specifications
 - Reduces routine maintenance costs and enables proactive maintenance practices based on equipment performance
- **LoopMetrics**
 - Optimizes the process dynamically throughout full operating range
 - Provides real time error distribution analysis
 - Provides process-based event logger
 - Allows for multiple loop tuning

Energy Management On-Line Plant Modeling Optimization

- Equipment performance modeling
- Contingency analysis/load shedding
- Remote breaker control
- Synchronization



Water Solutions

System Management and Optimization

- System-wide integration (multiple plants)
- Enterprise historian and report generator
- System-wide asset management and reliability programs
- Interface to LIMS, CMMS, GIS, CIS/FIS, plant security systems, and design database

Plant Controls and Monitoring Systems

- Distributed control system (HMIs, controllers, network, etc.)
- Plant historian and report generator
- Electronic documentation
- Integration with other systems and intranet/Internet
- Fieldbus solutions (HART, Foundation fieldbus, PROFIBUS, DeviceNet, etc.)
- Simulation
- ControlWave RTUs and PLCs

Simulation

- First-principle simulation
- Algorithmic simulation
- Tie-back simulation

Equipment Condition Monitoring

- Online/portable vibration monitoring
- Motor diagnostics
- Infrared thermography
- Laser alignment/balancing
- Oil analysis

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Engineering Services and Lifecycle Support

- Front-end engineering and design capabilities
- Installation, commissioning, and startup services
- Long-term maintenance
- Support, reliability, and maintenance services
- Optimization programs
- Educational services
- Integration services
- Security assessments
- Instrumentation maintenance





Benefits of Choosing Emerson

- Realize high process quality through implementing advanced coordinated control strategies, which reduces total suspended solids (TSS) and biochemical oxygen demand (BOD)
- Strengthen security through Ovation advanced security features
- Reduce chemical usage through tighter monitoring and control capabilities and optimized operations
- Maximize energy savings through integrated, real-time process and equipment information and coordinated, enterprise-wide energy management programs
- Achieve higher productivity, reduced operating costs, and better utilization of staff with advanced process automation, communication, and information management
- Reduce potential environmental problems, such as overflow, with early detection of failures and weather warnings
- Track and control manpower costs through a centralized monitoring and control system that reduces the amount of time and energy that personnel must spend on auxiliary equipment operation and maintenance

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