DeltaV™ Digital Automation System
System Overview
To develop and maintain a competitive advantage, it’s time to take your plant digital, with the first fully digital automation system—the DeltaV™ system. With a suite of digital busses, precision advanced control, and easy enterprise integration and optimization, the DeltaV system helps you improve your operations—easy.

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Digital plants made easy
PlantWeb® is a digital plant architecture that delivers proven results, and the DeltaV system makes it easy. Designed with this digital architecture in mind, the DeltaV system fully integrates “smart plant” capabilities including HART®, FOUNDATION™ fieldbus, high-speed discrete busses, embedded advanced control, and advanced unit and batch management.

This seamless, intelligent field integration provides the infrastructure for advanced applications such as AMS Suite: Intelligent Device Manager for quick, easy device re-ranging, configuration and diagnostics. The results are better process efficiency and reduced process variability.

Any size you want
The DeltaV system scales in both size and functionality. It’s the first fully digital system to offer you a single architecture with full functionality from a few to hundreds of thousands of I/O, so you can cost-effectively implement applications of any scope. You pick the functions that work best for your application across the entire system size.

The DeltaV system integrates easily with your existing automation systems to provide you a path forward, allowing you to benefit from the latest cost-saving technologies.

Leading the way
The DeltaV system has delivered a host of industry firsts—including simple plug-and-play OPC and XML integration, FOUNDATION fieldbus, batch control, and advanced control technologies. Being first with these technology innovations has made our users pacesetters in their industries. But more important, it’s delivered dramatic operational improvements: the kind of improvements you can start profiting from today.

Results that deliver
It’s no wonder that process automation professionals like you have voted the DeltaV system the leading process automation system for four consecutive years.† In the following pages, see why.

“Since installing PlantWeb, our 32-year-old petrochemical plant has reduced unplanned shutdowns from five or six times a year to two or three shutdowns a year, reducing maintenance budgets from $3 million to $2 million per year.”

—Adalberto Giovanelli, Petroquimica Uniao

† Control Magazine 2005 Readers’ Choice Awards, see www.EasyDeltaV.com.
The DeltaV system, a key component of the PlantWeb architecture, is the world’s first digital automation system.

Built with today’s technologies like PC workstations, Ethernet, digital busses, OPC and XML, the DeltaV system delivers more precise control, and predictive maintenance. And it delivers that information where and when it’s required.

Unlike other systems, the technologies were built from the ground up into a digital automation architecture, not bolted on after the fact. That’s what makes the DeltaV system easy to learn, easy to use, easy to maintain, and easy to connect to your existing automation.

Availability
While the DeltaV system is built with quality components, many customers seek further assurance—like the demands of increased uptime. You can choose the level of redundancy your application requires, including:
- Redundant Ethernet network communications
- Redundant controllers
- Redundant power supplies
- Redundant H1 FOUNDATION fieldbus interface and bus power
- Redundant digital HART I/O
- Redundant MODBUS and other RS485 serial communications
- Backup workstations.

Rugged control and field interfaces
Built to mount anywhere—minimizing your installation costs and ensuring safety. Meets:
- Class 1, Div. 2
- Zone 1 and 2
- Intrinsically safe options
- G3 corrosion resistance
- -40 to 70°C.

Commercial off-the-shelf technologies
Proven, low-cost, easily integratable commercial technologies are the fundamental building blocks of the DeltaV system: technologies proven across many industries and known by a wide pool of professionals.
- Windows workstation and server-based PCs
- Ethernet technology
- Bus standards.

Digital precision throughout the architecture
“The unique design of the DeltaV digital automation system simplifies the installation and commissioning process, enabling us to complete the project five months ahead of schedule....The quality of the gas is better than the standard of the Grade A specification.”

— Mr. Liu Yi  
Changquing Oil Field Company
You are faced with many options for automating your plants. What separates the DeltaV digital automation system?

Key system services built into the DeltaV software include:
- Peer-to-peer communications
- History services
- Event services
- Alarm services
- Time handling
- Hot expansion services
- Tag look-up services
- Diagnostic services
- On-line upgrades.

**Peer-to-peer awareness**
The DeltaV system keeps a real-time database available to all connected PCs and controllers. Functions difficult or impossible to implement in component-based solutions easily done in the DeltaV system include:
- System-wide alarm management
- Global security by user and function
- System and device diagnostics.

**Precision time keeping**
Across all PC workstations and controllers, precise time can be synchronized to the atomic clock. Time synchronization is available with full redundancy. Precision time means:
- Accurate, system-wide history
- Faster root cause analysis
- Sequence of events is built-in, not a 3rd-party add-on.

**DeltaV security is fully integrated with Windows security.**

**Embedded diagnostics simplify problem solving.**

**Built-in sequence of events capture exactly what occurs in your process.**

**Accurate, time-stamped and secure.**
Cabot’s HQ is considering standardizing the configuration in each subsidiary plant, requiring a standard configuration for our 20-odd factories. By using a standard package, we only used 2 weeks to set up testing. DeltaV provides technologies that make our standardization and security even more complete.”

—De-Quing Bi, Cabot
The DeltaV control hardware delivers big savings in the installation process. The compact, modular design allows you to cost-effectively meet your process needs.

Easy, flexible installation
Installation is easy since I/O is automatically auto-sensed when added to the system. No-value engineering is eliminated. DeltaV control hardware is built rugged and flexible to mount almost anywhere. It’s built for:
- Class 1, Division 2 areas
- CENELEC Zone 1/2 areas
- ISA-S71.04-1985 Airborne Contaminants Class G3.

Shared Zone 1 Remote I/O
Additionally, shared remote I/O is available for Zone 1 and Zone 2 installations. Unlike other remote I/O, shared remote I/O can be shared among several controllers for a greater range of applications and installation flexibility.

The DeltaV control hardware has many mounting options available to reduce your installation costs. Some options include:
- DIN-rail field junction box
- High-density cabinet mount
- DIN-rail wall mount
- Skid mount.

Hot swappable
Unlike other automation solutions, the DeltaV system lets you add system components including controllers, I/O, field devices and workstations while the system is powered and running. You can expand and upgrade your system on the fly with no downtime.

Classic field interfaces
The DeltaV system also supports a full range of analog, discrete, thermocouple, and RTDs for your existing field devices.

Intrinsically safe
The DeltaV intrinsically safe field interface subsystem connects intrinsically safe field circuits and field devices into Class 1, Division 1, Zone 1, and Zone 0 hazardous areas for most standard analog input, analog output, discrete input, and discrete output applications.

Field power injection
Unlike most existing automation systems, the DeltaV system injects field power right at the field interface terminations, significantly reducing installation cost by:
- Eliminating marshalling wiring
- Reducing cabinet or junction box footprint
- Reducing labor for additional terminations.

Grow your system on-the-fly with no
In one integrated field interface subsystem, the DeltaV system supports the following busses:
- FOUNDATION fieldbus
- HART
- AS-i Bus
- DeviceNet
- Profinet

Control redundancy
Reliability and increased system availability are built in throughout the DeltaV control hardware. Redundancy options are available for:
- Control and field interface power
- Controllers
- Controller Ethernet communications
- H1 FOUNDATION fieldbus interface
- H1 FOUNDATION fieldbus power
- MODBUS/RS485 Serial Interface
- Many classic field interface cards.

“On such a massive and centralized scale [10-plant petrochemical complex], this is probably the first project of its kind ever. In practice, the performance of the system is outstanding. We have achieved our objectives, and on the whole it is very satisfying.”

— Zhang Ziliang, SECCO

High density DeltaV vertical mount I/O saves space.
Unlike yesterday’s imprecise analog and hybrid automation systems, the DeltaV system delivers precision control, predictive maintenance and enterprise optimization for better plant performance using bi-direction digital communication with a network of intelligent field devices. And the savings are real and documented.

**Footprint savings**
The notion of I/O disappears in the digital bus environment. The “I/O” is in the field device. Cabinet and junction-box footprints are significantly reduced, slashing your footprint and installation costs.

**Wiring savings**
Digital bus installations reduce your wiring costs by providing multiple devices on a single pair of wires. Fewer wires mean lower installation costs, lower ongoing maintenance costs, and fewer drawings to create and maintain.

**Easy to add live**
Add digital busses devices, bus segments, bus interfaces, other field interfaces, controllers, and workstations, while the DeltaV system continues to control your process.

**Reactive vs. predictive**
Digital busses range in the amount of information they can transmit between intelligent field devices and digital automation systems. The amount and quality of information determine whether reactive or predictive maintenance can be performed.

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Reduce wiring, footprint, engineering and maintenance—easy.
Sensor busses—AS-i bus offers low-cost, simple installation of discrete devices, like pushbuttons, on/off valves, and proximity switches. Neither standard diagnostic nor validated information is automatically available.

Device busses—DeviceNet and Profinet typically connect motor starters, drives, and other more complex devices. They offer some level of diagnostics.

Fieldbus—FOUNDATION fieldbus and digital HART communications provide the most intelligence and ability to predict maintenance problems before they occur. FOUNDATION fieldbus devices deliver predictive alerts, millisecond data capture, validated data, field-based control, diagnostics, and asset information bi-directionally with the digital automation system.

Devices are automatically recognized by the DeltaV system as they are added. Your engineering and commissioning efforts are dramatically reduced.

Get the complete story on digital automation in the “We Do Smart Plants” brochure or on-line at EasyDeltaV.com/keytechnologies/fieldbus

“With FOUNDATION fieldbus for our process control and Profibus DP for our motor control, we have better information to optimize our process.”
—Tom Shaw Cargill

Cable tray changes after replacing classic I/O wiring with bus wiring.
The DeltaV suite of engineering tools handles configuration management, both locally and remotely, for all aspects of the DeltaV system and intelligent field devices.

Global, centralized configuration database
The DeltaV system coordinates all aspects of automation engineering:
- Control strategies
- Process graphics
- History
- Events
- Change management
- Bulk editing and data entry.

Unlike hybrid and component-based automation systems, operating faceplates and history collection are built automatically as you assemble your control strategies—easy.

DeltaV Explorer
You already know Microsoft’s Explorer, so you already know the DeltaV Explorer—it’s that easy. To reduce your engineering costs, the DeltaV Explorer provides:
- Library of proven, pre-defined control strategies
- Library of stress-tested digital bus devices files
- Context sensitive help
- Drag-and-drop configuration
- Right mouse click for easy discovery of available options
- Self-documenting control strategies.

System-wide plug and play
All DeltaV hardware is automatically recognized as it’s plugged in. No dip switches to set and consume your valuable resources. And, intelligent field devices like FOUNDATION fieldbus are automatically recognized when connected.

Faster engineering of big systems
For those really large or tight deadline projects, the DeltaV system’s multi-client architecture provides you:
- Off-line configuration
- Bulk import from third-party software, including Intergraph’s SmartPlant Instrumentation (INtools)
- Bulk editing in spreadsheet mode.

DeltaV Control Studio
Built on IEC 61131-3 control languages, including function block diagrams, sequential function charts and structured text, Control Studio provides a drag-and-drop palette to easily design and document your control strategies.

Types of control you can develop include:
- Logic
- Regulatory
- Sequential
- Advanced control.

With libraries of pre-defined control strategies and digital bus device files, exploring the DeltaV modules is easy.
“Since the installation of PlantWeb, we have much better control. Our technologists are able to start up and shut down the plant in fast and automated mode and walk away to perform other duties.”

— Damir Gizatullin, Nizhnekamskneftekhim (NKNH)
The DeltaV operations software provides an easy-to-use environment for process operations and information access. All operations applications are fully remotable for access anywhere on your plant Ethernet network or via modem.

**Easy to learn, easy to use**
Operator graphics are easy to learn and use. DeltaV users around the globe report cutting their operator training costs by half or more.

One-click access to alarms, alarm summaries, trends, display navigation and on-line help: these come pre-engineered, reducing the cost of engineering the system compared with component-based automation systems.

Additional DeltaV simulation capabilities provide single PC and multi-node training systems to get operators familiar with the process before it goes on-line.

**Secure environment**
DeltaV Flexlock security restricts access to the underlying Windows workstation operating system. No more games, accidental file deletions, activities that take hours to repair, or unscheduled outages.

**Premier alarm management**
Digital automation systems receive validated data, displaying quality, status, and diagnostics from intelligent field devices. This is the foundation of precision alarm management. The DeltaV system ends the arguments of process problems versus device problems by reporting the actual facts.

**Alarm suppression**
Alarm management is built on EEMUA 191, developed by a consortium of leading process industry automation users and suppliers, designed to eliminate nuisance alarms.

Supporting EEMUA 191 standards, the DeltaV system allows:
- Operator suppression of alarms
- Time-stamp and history of suppressed alarms
- Removing suppressed alarms from alarm banner and alarm summary
- Maintaining a suppressed alarm summary.

**Conditional alarming**
What used to require complex control logic to address is now simply filtering for each alarm. Many nuisance alarms can be eliminated with a simple time-in-condition filter.

**Smart alarms**
With every control strategy you can easily create smart alarms, like “filter clogged” instead of ones which must be deduced like “pressure low”. Other systems required layered, expensive applications to achieve this level of sophistication.

Intuitive alarm management.
Information Access

DeltaV Analyze
To quickly diagnose the historical alarms and events stored in the DeltaV Event Chronicle or the Plant-Wide Event Historian, DeltaV Analyze presents you the information in a single overview web page. With one click you can determine which areas and modules had the most alarms in a particular month, along with the distribution of alarm priorities, types of alarms and alarm frequency.

“We have set conditional and deviation alarms that warn us of problems, and we can then take action to prevent a shutdown. These unplanned shutdowns have been reduced 10%.”

—Peter Montforts, Eka Chemicals
DeltaV Continuous Historian extends the PlantWeb network of digital intelligence to history collection.

History with status
Unlike other historians, only the DeltaV Continuous Historian collects the associated status along with the value from intelligent field devices. Applications like the embedded DeltaV advanced control software which require historical data automatically flag areas of questionable data which allows you to avoid using unreliable data for more precise modeling and control.

Easy configuration
DeltaV embedded history also means easy setup and maintenance. Just click and drag plant areas in the DeltaV Explorer onto a workstation, and all modules within the area are automatically historized. Status is collected automatically with the value so no additional configuration is required to take advantage of the intelligent field devices.

Each control module—the fundamental building block of control strategies—maintain its own continuous historical configuration information. All of the module parameters are available for historical collection. Event history is automatically collected—it’s easy.

History View Suite
The DeltaV History View Suite provides continuous trends, event views and batch views to intuitively present these different types of historical information. View your operation’s real-time and historical information integrated into a single view, helping you pinpoint trends and events affecting plant operation.

The DeltaV system was the first to integrate continuous and event information into a single view. Event data is presented in context to the trend data so you can easily see whether a user change—such as moving a setpoint or altering a tuning parameter affected the process.

Easy enterprise connectivity
Since the history database is fully compliant with open, interoperable standards like OPC and XML, it easily connects with:
- Microsoft Office applications
- Reporting and analysis applications
- Manufacturing and enterprise systems.

Capturing digital intelligence into history.
Advanced Control applications read status information to avoid using unreliable data for predictions.

DeltaV Historian collects status along with value from intelligent field devices.

“The trending kicks butt—it does!”

—Norm Rowe
Purdue University
Only digital automation systems and the PlantWeb architecture, are built to turn the wealth of diagnostic data in intelligent field devices into focused, actionable information. The DeltaV system with AMS Suite software helps you move from preventive and reactive maintenance to predictive maintenance.

**Predictive alerts**
Alerts generated by the intelligent devices report impending problems to the DeltaV system: alerts like excessive valve stem travel, plugged impulse lines, and impending sensor failure. These alerts are reported to the operator with the suggested corrective actions to take; to the maintenance work order system; and even to pager, phone, or email if the critical nature of the device warrants it.

**Prioritized variability reduction**
DeltaV Inspect gives your maintenance staff a complete list of opportunities for process improvement, sorted by the potential they have to reduce the variability of the process. The prioritized list includes:
- Uncertain device input reported
- Loop mode not in auto
- Control limited
- Excessive loop variability.

This summary of improvements can be reported via email, web page, or via the DeltaV Inspect application.

**DeltaV system with AMS Device Manager**
AMS Device Manager provides easy access to vital device information for calibration, configuration, device audit trail, and advanced diagnostics for predictive maintenance.


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*PlantWeb in action—the proven power of predictive maintenance*
AMS ValveLink software
Run diagnostic tests while the valve is in service from the Station Operator to determine if maintenance is required. Performance diagnostics allow you to prevent unplanned shutdowns, and to extend the intervals between shutdowns. Compared with past practices of pulling valves out of service on a preventive schedule, your maintenance costs can be dramatically reduced.

AMS SNAP-ONS like AMS ValveLink for advanced valve diagnostics. For a complete list of SNAP-ONS, visit: www.EmersonProcess.com/ams

“If the maintenance staff is not available our process staff can perform the maintenance function with the embedded diagnostics available in PlantWeb and the DeltaV system.”
— Marconi Madruga, Petroflex

AMS Reduces Unplanned Shutdowns
The DeltaV suite of embedded advanced control products gives you the capability to develop the right control strategies for your plant, at a fraction of the traditional cost. Designed for use by any process engineer, advanced control has never been easier.

Start with a strong foundation
Advanced control starts with good measurements and well tuned regulatory control loops. DeltaV Advanced Controls use validated data and equipment health information to insure appropriate control action is taken. Our suite of monitoring and tuning applications insure your regulatory controls are a strong foundation for advanced control.

Improving control loop performance
Advanced control begins with better regulatory control. DeltaV software provides the tools to monitor, analyze and tune your control loops for peak performance.

DeltaV Inspect
Control Performance Monitoring has never been easier. Loop by loop, DeltaV Inspect seeks out excessive variability, limited outputs, incorrect control modes, and intelligent device problem—helping you to focus efforts to improve plant performance.

DeltaV Fuzzy
The DeltaV Fuzzy logic controller is an effective alternative to PID control when fast response, minimal overshoot, and tolerance to noisy signals are a requirement. Predefined fuzzy logic in a standard DeltaV function block makes this application both easy to implement and maintain.

DeltaV Tune
This easy-to-use tuning solution for your PID and Fuzzy control loops is included with every system. With automated process testing, a user-friendly graphical interface, and a patented, field-proven algorithm, DeltaV Tune minimizes the time required for to establish stable, responsive control loops.

DeltaV Neural
DeltaV Neural gives you a practical way to create virtual sensors for measurements previously available only through the use of lab analysis or online analyzers. DeltaV Neural is easy to understand and use, allowing process engineers to produce extremely accurate results even without prior knowledge of neural network theory.

DeltaV Predict and DeltaV PredictPro
Use the power of Model Predictive Control to easily address process interactions and difficult dynamics. Since DeltaV Predict and PredictPro are fully embedded in the DeltaV system, you may configure, validate, test and deploy your multivariable control strategies for a fraction of the costs of traditional advanced control system.

Totally integrated history—easy.
Real-time Optimization—AMS Optimizer
For highly complex or non-linear processes, AMS Suite: Real-Time Optimizer provides rigorous model based optimization, data reconciliation, and performance monitoring to maximize your plant efficiency and operating margins. For more, visit: www.pmo.assetweb.com

DeltaV Simulate and DeltaV SimulatePro
DeltaV Simulate lets you use all DeltaV software for off-line training and development without purchasing duplicate system hardware. This means you can use exactly the same software provided with your actual DeltaV system at a fraction of the cost.

For system checkout and operator training, you may use your exact same control configuration tied into a process simulation, implemented with function blocks or any OPC-compliant simulation package.

For operator training and application checkout, DeltaV SimulatePro offers the ability to run faster or slower than real-time, and to save and restore simulation runs for future recall.

For additional information on the embedded advanced control, simulation and optimization software suite, refer to the DeltaV Precision Control brochure or visit: EasyDeltaV.com/keytechnologies/advanced

“While there are still some geometric process controllers and expert systems running advanced process control algorithms on site, they’re few. Most of the benefits have been transferred into the DeltaV system running multi-variable control and fuzzy logic.”

—Chris Garton, INEOS Chlor
With this class-based approach, you get reusable equipment control strategies—saving you time. Additionally, the state transition diagram logic built into the phase class provides you with multiple phase states, automatic state switching, and failure monitoring all pre-engineered.

The phases and units executing in the controller support aliasing and dynamic referencing for your most demanding applications. And the phases may be orchestrated by the DeltaV recipe management and execution software, including the use of recipe parameters and history collection.

**Unit management and batch control**

If your process application requires complex batch processing, the DeltaV system’s “built for batch” architecture is the answer. This architecture provides a comprehensive set of easy-to-use tools for designing and implementing cost-effective batch control solutions.

The DeltaV Batch solution—built on the S88.01 standard—addresses the entire scope of functionality identified in the S88.01 Control Activity model including:

- Device control
- Unit supervision and management
- Process management
- Recipe management
- Production scheduling
- Production information management.

**Class-based Approach**

*Batch and Advanced Unit Management add class-based units and phase logic used for batch processes and complex sequences in continuous and hybrid processes.*
Saves Time and Money

Easier regulatory compliance
In highly regulated industries, the need for better quality and operational effectiveness has led to an alliance between Emerson and Decision Management International, a leading compliance and paperless workflow solution provider.

Emerson expertise coupled with DeltaV Advanced Unit and Batch Management and DMI Compliance Suite software helps manufacturers improve release cycle times and reduce manufacturing variability.

For more details consult the “DeltaV Built for Batch” brochure or visit: EasyDeltaV.com/keytechnologies/batch

“Our ability to reuse the validated modules, developed in partnership with Emerson, over and over again enables cost efficiencies and earlier startup dates.”

— Phil Maderia, Genzyme
As businesses seek to increase their efficiency, minimize their operational costs, and maximize their value to their customers, connecting the automation system with the enterprise becomes increasingly important.

Connecting these systems leads to:
- More efficient plants
- Optimized supply chains
- Lower direct labor costs
- Lower production and product costs
- Improved regulatory compliance reporting and tracking
- Reduced inventory and delivery times.

**Commitment to open interoperability**
Over time, Emerson has led the way among automation suppliers in developing their products to the prevailing open, interoperable standards. Where incomplete or no standards existed, Emerson has donated technologies and expertise to standards bodies like the HART Foundation, Fieldbus Foundation, and OPC (OLE for Process Control) Foundation. The results of this commitment have meant lower cost, and easier to maintain enterprise integration for process manufacturers.

**Complete information access**
Depending on the enterprise system requirements, the DeltaV system provides open interoperable access to:
- Real-time process data
- Real-time alarm and event data
- Real-time batch execution data
- Historical process data
- Historical batch data
- System configuration data.

Access to this data is based on open standards such as OPC, SQL server, XML, and Web services.

**.NET technologies**
Microsoft .NET technologies including Web services are built to standards like XML and RSS (really simple syndication), and provide a common framework for applications and browsers to share information. DeltaV Web services connect directly with DeltaV data repositories to provide the foundation for integrated enterprise solutions.

An example of these solutions is when the DeltaV system delivers inventory information to suppliers for inventory management and plant scheduling. Production scheduling is automated, with the ERP system delivering production schedules and quotas to the DeltaV system, interacting with the associated real-time data interfaces described earlier. During and after production, the DeltaV system reports back to the ERP system, providing status, quality, and consumption data from the associated real-time and historical data interfaces.

**Right person, right time**
With an open, interoperable automation system like the DeltaV system, you can use standard XML transactions for routing events to email, pagers, personal organizers and SMS cell phones, narrowcasting the right information to the right people who need to act upon it. Example: When an intelligent valve positioner begins to notice the valve sticking, it can notify the on-duty maintenance technician’s cell phone to solve the issue, before an unplanned shutdown occurs.

Integration has never been easier.
Data management services
Since no two businesses operate identically, technology alone is not the solution. Our global network of data management services experts can architect and execute information solutions to help your organization use the information within the sphere of the automation system and connect it with your enterprise to improve your operational effectiveness.

Emerson expertise, coupled with alliances with leading software providers like OSIsoft and Decision Management International, provides the platforms for solutions that improve efficiency.

“The DeltaV system and PlantWeb architecture are indispensable aids for managing missions, preventing spills, improving safety, maintaining our ISO 14000 certification, reducing worker presence in the field, and substantially lowering maintenance costs.”

—Miguel Sanchez, Repsol
DeltaV SIS, at the heart of Emerson’s smart SIS, uses digital communications to continuously diagnose your intelligent field devices and safety functions. This helps ensure your process shuts down when it should—not when it shouldn’t.

The Smart Approach
Emerson Process Management continuously diagnoses the sensors, logic solvers, and final control elements to ensure they perform on demand.

Hazardous area avoidance
DeltaV SIS logic solvers pass status data from the safety sensors and final control elements to AMS Device Manager, which gives clear and specific descriptions of faults to simplify repairs and reduce visits to hazardous locations.

Easier regulatory compliance
The DeltaV SIS system, with AMS Device Manager, reduces the cost and complexity of IEC 61511 compliance. The system:

- Tracks all changes to the safety logic and field device configuration
- Confirms all logic solver writes from the HMI
- Has rigorous safety user management.

Easy to engineer
Rich, TÜV-approved function blocks speed configuration and testing of the SIS logic. They include:

- Analog and Discrete Voters
- Cause and Effect Matrix.

SIL 1, 2, 3 suitability
DeltaV SIS is rated to include SIL 3 safety functions. The SIL 3 rating gives assurance of the extremely strict design and quality management of the DeltaV SIS development environment.

Increased availability
Sensors and final control elements cause over 85% of the faults in an SIS. Emerson’s smart SIS:

- Minimizes the time to repair faulty sensors and final controls
- Increases process availability with predictive maintenance diagnostics
- Removes the need for components like HART multiplexers
- Extends proof test intervals with automated testing.

Integrated but separate
DeltaV SIS uses dedicated logic solver hardware, software, and networks to ensure separation from the control system. However, there is a single interface for all aspects of engineering, operating, and maintaining both the DeltaV SIS and the DeltaV digital automation system.

Safety with less risk and increased availability...
**Any size application**
DeltaV SIS will scale to fit any safety application. Add logic solver modules to increase the overall processing, memory, and I/O handling capabilities of the system as your applications grow.

For more details consult the “Safety Instrumented Systems—The Smart Approach” brochure or visit EasyDeltaV.com/SIS

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“DeltaV SIS was best suited for our safety shutdown applications because of its modularity, integration with the control system, and safety loop diagnostics.”

—Steve Schmitz, Rohm and Haas
Your automation investments over the last 20 years have helped you to gain a competitive edge, while delivering a sizable return on investment. But with today's increasing global competition, you need even higher performance from your process.

**Expand, interoperate, transition PROVOX®, RS3®.** At your pace, you can expand, interoperate, and eventually transition your PROVOX or RS3 equipment to the PlantWeb architecture.

Expand your control performance with a stand-alone DeltaV system, or connect the systems via time-tested, proven serial connections or OPC Mirror connections.

Interoperate systems with applications like DeltaV Operate for PROVOX and DeltaV Operate for RS3 to provide a common operator station across your systems.

You can transition your PROVOX or RS3 controllers for the additional performance and embedded advanced control, digital busses, and comprehensive diagnostics supported by DeltaV controllers. DeltaV Controller for PROVOX I/O and DeltaV Controller for RS3 I/O help you maintain your I/O and wiring investments—reducing commissioning time and expense.

**Other DCS and PLCs.** DeltaV transition solutions, available for most automation suppliers’ legacy DCSs and PLCs, help you to maximize the return on the equipment you’ve already purchased and take advantage of today’s technologies.

For more, visit: [www.EasyDeltaV.com/solutions/dcs](http://www.EasyDeltaV.com/solutions/dcs)

Operate both your PROVOX and DeltaV controllers from the intuitive DeltaV Operator Interface.

Maximize your investment and improve your plant’s performance.
We connected a DeltaV I/O system to our installation, which has been controlled by RS3 for 15 years. The system is allowing for a seamless upgrade to existing architecture, melding the new with the old—at the same time—at the same time—giving us greater functionality and future plant control system improvement capability.”

—Brian Flanagan
Lafarge Woodstock

**System Life Planning**
Emerson can help you with the System Life Planning process, part of the SureService™ family of support services. A system life study reviews your automation system’s current status, evaluating operational, process and maintenance issues affecting your plant. It also incorporates your plant’s business direction, objectives, and issues creating a plan that:
- Builds a financial justification case
- Identifies plant business benefits that justify upgrades
- Creates a versatile road map that adjusts to changes in business conditions
- Enables a means to manage maintenance costs
- Identifies measurable operational improvements
- Incorporates years of experience from process and product experts.

A site study typically requires 3 to 5 days, teaming with key plant personnel, consulting with plant management, operations, process engineers, and maintenance. Following study phase completion, you’ll get a report listing the business and process objectives identifying project benefits, an automation system obsolescence sensitivity analysis, and a road map with recommendations.
Performance improvement is the primary objective of process management. Creating greater potential for shareholders, customers and employees is the key. How best to do it is the question. And more than ever before Emerson is the answer.

Emerson can help you design, build, commission, and maintain your process operations through our global experts in the power, pulp & paper, oil & gas, chemical, life sciences, and food & beverage industries. Working together, we help you achieve higher quality, greater reliability and faster time to market, while steadily advancing productivity and profitability.

**Project Services**
Emerson’s global design, engineering, and project management teams combine expertise in your industry with expertise in the latest digital automation and smart safety instrumented system technologies to help you deliver an advantage in all phases of new construction and commissioning.

Our TÜV-certified safety services provide you IEC 61511 compliant safety projects.

For more on our project services capabilities, visit [www.EmersonProcess.com/Solutions/ProjectServices](http://www.EmersonProcess.com/Solutions/ProjectServices)

**SmartProcess Optimization Services**
SmartProcess® optimization solutions combine the industry, process, and advanced control expertise of the Emerson organization with advanced control technologies to increase plant efficiency and improve business results—with lower risk than custom solutions.

SmartProcess solutions’ more precise control results in reduced waste, improvements in product quality and consistency, reduced raw material costs, reduced energy costs, and improved process throughput.


**SureService Support Services**
The SureService program from Emerson Process Management offers an array of support services designed to help you achieve your business objectives, reduce or contain your operating and service costs, and keep your systems running at peak performance.

For more on SureService Support Services, visit [www.EmersonProcess.com/Solutions/ProjectServices](http://www.EmersonProcess.com/Solutions/ProjectServices)

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**Emerson Expertise**

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Across the Lifecycle

It’s a partnership with a company that knows your business and can help you operate your plant safely, reliably, and more efficiently.

From expert technical support to the right combination of on-site and remote services, we help you get the most value from your automation investment.

For more on our SureService Support services, visit: www.SureService.com

**Asset Optimization Services**

Emerson’s Asset Optimization experts help you take advantage of the predictive intelligence in your PlantWeb digital plant architecture. We’ll help you diagnose efficiency losses and provide corrective action plans to move your operations toward improved performance.

And, we can help you find those losses of productivity that have no readily apparent cause.

For more, visit: www.AssetWeb.com

**Upskilling your workforce**

Every worker wants to be successful and equipped to assist the plant in reaching its true potential. Engage Emerson to bring an education consultant to your plant for an in-depth assessment of your educational needs.

Embark on a disciplined process of upskilling your workforce through the use of:
- Classroom training at the factory
- In-plant training where the trainer comes to your plant
- Web-based eLearning for refresher and continuing education.

For more, visit: www.EmersonProcess.com/education

“The Emerson people were tremendous to work with and were key to the success of the project.”

— Bob Sherven, Shell Deer Park Refinery
As a core element of the PlantWeb digital architecture, the DeltaV systems makes controlling your process easy.

Customers who have requested this brochure have also requested the following brochures:

- DeltaV—We Do Smart Plants
- DeltaV System—Built for Batch
- DeltaV Precision Control
- Safety Instrumented Systems—The Smart Approach
- Emerson Project Services
- SureService Customer Support Programs