Digitally Transform Your Oil and Gas Production Operation

FB3000 Remote Terminal Unit
Fully integrate measurement and control across your wellpad operations with agile, scalable automation that is easy to configure.

EMERSON

Take a More Agile Approach to Position Your Operation for Long Term Success

Chances are high that aging assets and multiple technology platforms are negatively impacting profitability and cash flow. Your long term success depends on a forward-looking automation strategy that allows your operation to standardize on scalable, intuitive technologies. Rather than expending the additional time and resources required for a multi-vendor approach, your staff can work more efficiently than ever before by having a common set of software tools and technologies to use. Start your journey to Top Quartile performance by digitally transforming your operation with an agile measurement and control platform that streamlines complex processes and mitigates issues with measurement uncertainty, downtime and safety.

The Opportunity for Operators

Production
8% higher
cumulative production

Cost
40% lower
lease operating expenses (LOE)

Safety
½ recordable
incident rates

Sources: Lower 48 US liquids-weighted LOE Benchmarks, EnerCom, OSHA, EPA FLIGHT, Company Reports and Emerson Customer Business Results

What if you could digitally transform your operation to optimize production while minimizing costs and ensuring productivity goals are met?

Implement the Right Automation Strategy with Emerson's Flexible FB3000 RTU

Establishing a secure, standardized automation infrastructure for sharing data and diagnostics enterprise wide will drive ongoing operational improvements. That's why we designed Emerson's powerful next-generation FB3000 RTU with the hardware, software and applications necessary to drive Digital Transformation throughout your operation. From superior form and function to industry leading configurability and programmability, the agile FB3000 RTU will easily evolve along with your changing site requirements.

FBxWifi™

Configuration & Management Applications
A single set of intuitive tools for FB Series Devices
- FBxConnect™ Configuration Software
- FBxDesigner™ IEC 61131-Compliant Programming Software
- FBxVue™ Custom Display Builder

Highly Scalable

From a single measurement point to your largest wellpad, the FB3000 RTU can easily scale to meet your needs, including complex logic and control. One RTU can measure and control gas, liquids or both on up to 36 meter runs. Simply expand capacity as needed by adding I/O modules to an existing RTU for flexibility without complexity.
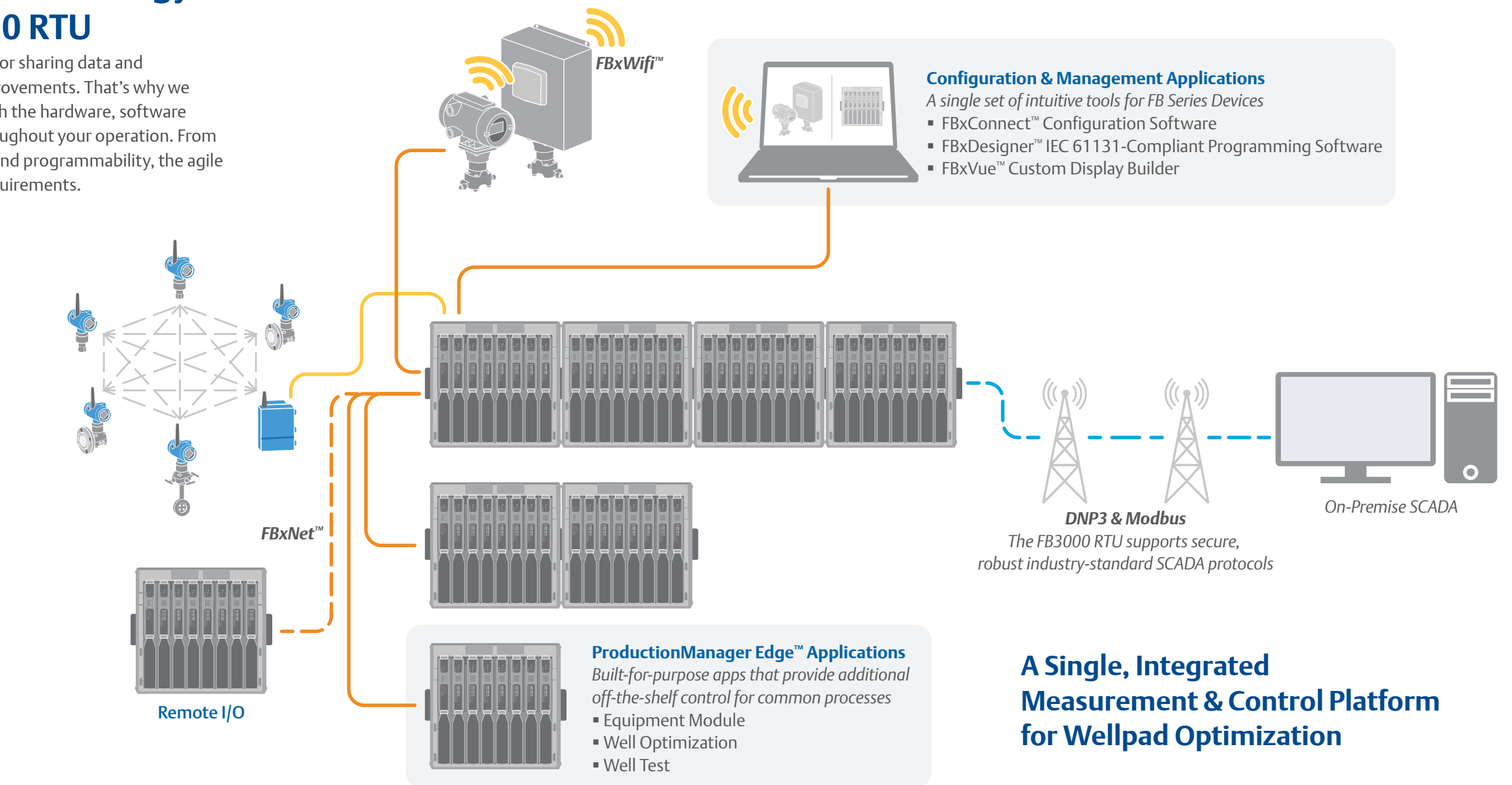
Programmable Control

Get as much control as you need right out of the box with our intuitive FBxDesigner™ software. Users have the flexibility to customize the complexity of logic and control with our complete suite of powerful, built-in IEC 61131 programs. Your staff will quickly gain expertise and move beyond basic configuration into programming to ensure the control requirements align with your site needs.

FBxNet™

DNP3 & Modbus
The FB3000 RTU supports secure, robust industry-standard SCADA protocols

On-Premise SCADA

Remote I/O

ProductionManager Edge™ Applications
Built-for-purpose apps that provide additional off-the-shelf control for common processes
- Equipment Module
- Well Optimization
- Well Test

A Single, Integrated Measurement & Control Platform for Wellpad Optimization

Online Editing

Maximizing uptime and asset availability requires the versatility to edit programming and configuration without powering down the FB3000 RTU or restarting the CPU. Our new online editing capability makes it easier than ever for authorized users to make changes. No need to interrupt flow measurement or control to complete load changes or other edits.

Measurement Accuracy

API, AGA, GPA, GERG, and ISO compliant calculations ensure accurate, reliable measurement of oil and gas fluids. In addition, separate communication channels allow for real-time system diagnostics.

Secure

Ensure your operation's risk mitigation strategy is complete by protecting your system and maintaining the integrity of your data. The FB3000 RTU enables your operation to maintain a more secure infrastructure by prohibiting unauthorized users from accessing your system. Additional built-in features ensure the authenticity of your data to help with proving compliance while extensive data logging helps minimize disputes and improves customer satisfaction.

Ultra Reliable Performance

With a much lower power draw than a PLC, the FB3000 RTU is ideal for remote wellpads. It can easily function on cost-effective solar power, providing greater design flexibility for new wellpads where utility power is limited or non-existent. In the event of a power loss, dual power input blocks provide automatic failover to ensure continuous operation. Plus, the standard operating temperature range of -40°C to +75°C enables the RTU to reliably operate without needing to be inside of a temperature controlled environment.

Seamless Integration

Leverage your existing sensors and communication infrastructure while bringing real-time information management capabilities into your operation with the FB3000 RTU. Seamlessly integrate this scalable, performance-driven technology into your operation to meet current requirements while capitalizing on the expandability to fulfill more complex measurement and control needs in the future.
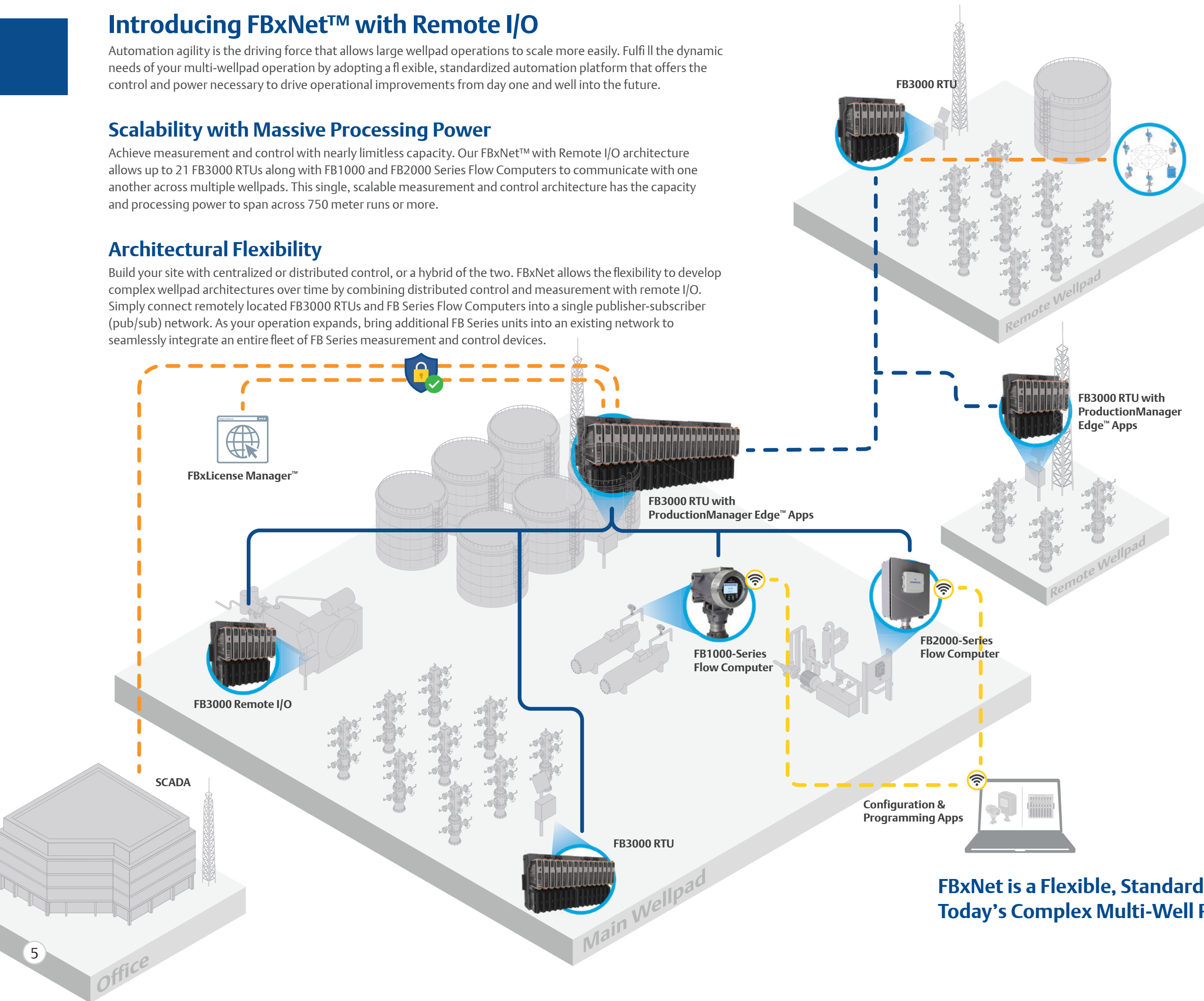
Introducing FBxNet™ with Remote I/O

Automation agility is the driving force that allows large wellpad operations to scale more easily. Fulfill the dynamic needs of your multi-wellpad operation by adopting a flexible, standardized automation platform that offers the control and power necessary to drive operational improvements from day one and well into the future.

Scalability with Massive Processing Power

Achieve measurement and control with nearly limitless capacity. Our FBxNet™ with Remote I/O architecture allows up to 21 FB3000 RTUs along with FB1000 and FB2000 Series Flow Computers to communicate with one another across multiple wellpads. This single, scalable measurement and control architecture has the capacity and processing power to span across 750 meter runs or more.

Architectural Flexibility

Build your site with centralized or distributed control, or a hybrid of the two. FBxNet allows the flexibility to develop complex wellpad architectures over time by combining distributed control and measurement with remote I/O. Simply connect remotely located FB3000 RTUs and FB Series Flow Computers into a single publisher-subscriber (pub/sub) network. As your operation expands, bring additional FB Series units into an existing network to seamlessly integrate an entire fleet of FB Series measurement and control devices.

FBxLicense Manager™

FB3000 RTU with ProductionManager Edge™ Apps

FB3000 Remote I/O

FB1000-Series Flow Computer

FB2000-Series Flow Computer

SCADA

Configuration & Programming Apps

FB3000 RTU

Main Wellpad

Office

Fully Integrated Measurement & Control

Minimize the number of devices on your wellpad. With measurement supported by standard firmware in the FB3000 RTU, the RTU can also function as a flow computer/EFM. Data integrity is assured since the firmware is rigorously tested by Emerson and by recognized third parties. Plus, no additional third party modules are needed to ensure measurement is fully compliant. Our FB3000 RTU offers the flexibility of an expansive metrology calculation suite along with multiple I/O options and industry-standard communications for a highly reliable, all-in-one solution.

Secure Data Sharing

Get robust control by enabling secure yet easy-to-configure data sharing between multiple dispersed devices. Our FBxNet pub-sub network facilitates I/O distribution with the subscriber FB3000 RTU able to handle 5,000 parameters per Ethernet port and up to 10 publishers which can be a mix of FB3000 RTUs and FB Series Flow Computers.

Additional Control for Common Processes

Ensure a standardized yet flexible approach to managing common production processes. Our built-for-purpose ProductionManager Edge Application Suite provides additional off-the-shelf control to assist with managing the lifecycle of the well from flowback to abandonment, well testing for allocation purposes, and complete fluids management from well-to-sell.

A Better User Experience

Streamline training and drive consistent maintenance practices across your operation to enhance productivity and reduce operating expenses. Users can efficiently manage a fleet of FB Series devices with a single set of intuitive configuration and programming tools. Once the RTU is in operation, online editing of the control load along with hot-swappable I/O and our new personality modules that separate termination from the I/O and CPU modules ensure maximum uptime and simplify maintenance.

FB3000 RTU

Remote Wellpad

FB3000 RTU with ProductionManager Edge™ Apps

Remote Wellpad

FBxNet is a Flexible, Standardized Automation Platform for Today's Complex Multi-Well Pad Architectures

Streamline Your Measurement & Control with Our Scalable, Future-forward FB3000 RTU

Put your operation in control of the ongoing technology evolution in oil and gas by standardizing on a single, scalable automation platform that delivers the power and performance necessary for the largest wellpads. The FB3000 RTU is designed to seamlessly integrate into your operation to meet current requirements while providing the flexibility and scalability to fulfill more complex measurement and control needs in the future. Powerful, onboard yet easy-to-use configuration tools will enable your staff to achieve expansive control capabilities without tedious programming to expedite deployment while built-in calculations will make it easier than ever to adhere to and prove compliance with fiscal measurement standards. Digitally transform your wellpad operations with future-forward automation that will help you successfully drive greater efficiencies while maintaining safety standards, improving cost control, and protecting your data.

With technology that is easy to set up, deploy and maintain, your staff will spend less time in the field, resulting in greater productivity and fewer safety incidents.

Achieve Your Business Objectives by Investing Wisely

Maximize production throughout your wellpad's lifecycle by taking a standardized approach to automation. Our FB3000 RTU offers a complete, extensible automation platform that provides the design flexibility to architect a measurement and control system customized to meet your current needs while offering superior scalability for the future.

Production Optimization ▶ p9

Deploy Agile Technology that Adapts to Your Needs

The one constant in upstream is change, and staying ahead of it will protect your operation from incurring unnecessary expenses. The agile FB3000 RTU allows you to scale up with confidence and offers as much control as you need to fulfill a range of operational requirements, from small to large and simple to complex.

Change Management ▶ p11

Empower Your Staff to Drive Results

Improve the effectiveness of your workforce by providing a more intuitive user experience. The FB3000 RTU offers a single set of easy-to-use software tools that provide the best blend of configurability and programmability on the market today, including powerful yet flexible IEC 61131 programming tools as with any PLC.

Productivity ▶ p13

Establish a Secure, Standards-Based Platform

Get the capacity to efficiently handle and reliably archive vast amounts of data in a secure infrastructure. Our robust FB3000 RTU ensures authenticated communication and controlled access with users able to store any type and quantity of data, including operational and diagnostic data, historical logs, and more.

Safety & Security ▶ p15

Achieve Your Business Objectives by Investing Wisely

Meeting production and LOE targets long term requires a standardized approach to automation. Emerson's FB3000 RTU is designed to ensure your operation achieves its full potential by providing accurate, reliable performance while reducing complexity. With our extensible automation platform, your operation will have the design flexibility to architect a measurement and control system within budget that is customized to your needs. Our next-generation automation platform offers multiple I/O options, an expansive metrology selection, and industry-standard communications to provide a complete yet flexible solution. In addition, taking a single vendor approach mitigates issues with third party support or other integration challenges that can lead to unnecessary complications, cause delays, and increase costs. Enable your operation to reach its full potential with the agile FB3000 RTU that can be configured to meet your specific architecture, information, operation, automation, and measurement needs.

Meet Production and LOE Targets
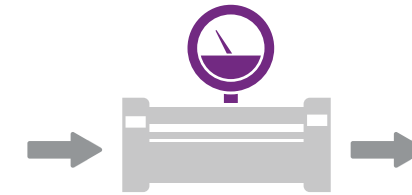
API, AGA, GPA, GERG, and ISO compliant calculations adjust for operating conditions to give reliable and accurate measurement of oil and gas fluids.

Optional control capabilities easily enable enhanced oil recovery through gas injection to boost production.

Industry-proven ProductionManager Edge™ applications can help manage bottom hole pressure to increase well production.

Reduce Deferred Production and Increase Uptime
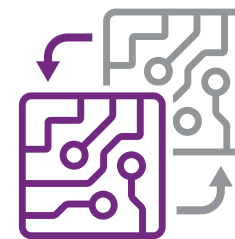
Rugged electronics for field applications feature our new personality termination modules that provide a cost-effective, safe, hot-swappable design to expedite board replacements.
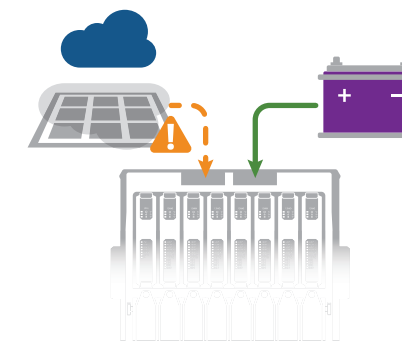
Dual power supplies that provide automatic, redundant failover with the secondary power supply, fueled by battery or solar power, taking over if the primary power supply fails.
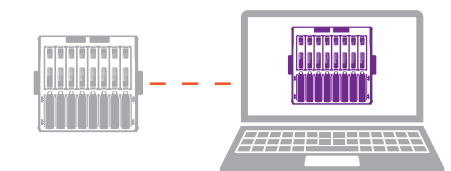
Built into the heart of the design, a separate bus allows for real-time system diagnostics which are isolated from general system operations.

Architect Your Site with Centralized or Distributed Control — Or a Hybrid of Both
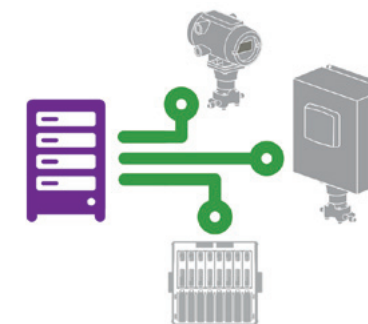
Seamlessly integrate an entire fleet of remotely located FB Series Flow Computers and FB3000 RTUs into a single distributed control architecture using FBxNet.
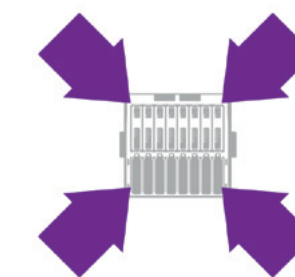
Reduce device footprints by allowing more I/O and control to be consolidated in a single, centralized RTU that is utilizing remote I/O.
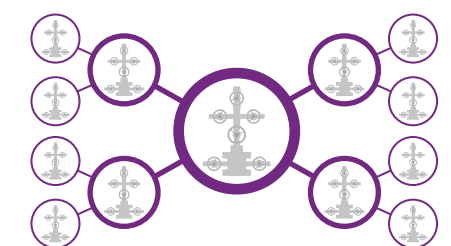
Combine remote I/O with distributed control and measurement to achieve the flexibility and scalability needed for large, complex wellpad architectures.

Deploy Agile Technology that Adapts to Your Needs

Large wellpads have evolving operational complexities and agile automation is a necessity to keep up with everchanging requirements. The next-generation FB3000 RTU is an agile automation platform that is engineered to fulfill a range of measurement and/or control requirements – from small to large and simple to complex. Easily increase capacity as needed with a single FB3000 unit that can scale from one meter run to 36 meter runs of gas, liquids or both. If greater capacity is required, the RTU's extension chassis offers more I/O capability within a flexible architecture that can range from low power applications to high density I/O and distributed I/O and control all in one platform. The RTU's modular, extended backplane features high throughput, extension, and isolation, all of which is inherent in the design, enabling the FB3000 RTU to meet just about any wellpad requirement.

Scale Up with Confidence

Improve quality with the highly scalable FB3000 RTU that ensures producers can employ consistent practices across multiple assets regardless of size.
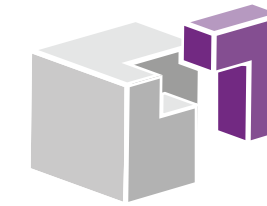
Scalability allows users to efficiently meet the needs of a single measurement point to the largest wellpad, with simple redundancy options for peace of mind.
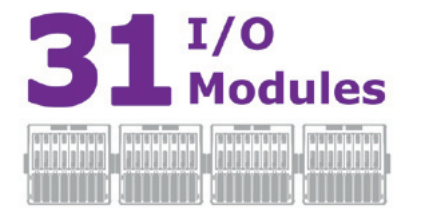
Adding I/O modules and/or another chassis to the base FB3000 RTU is straightforward with no downtime involved, allowing expansion of up to 31 I/O modules.
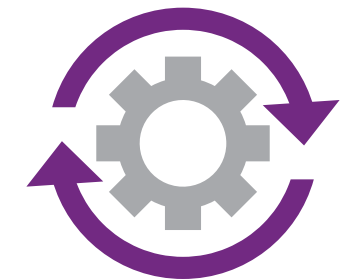
Configure Based on Your Requirements

Comprehensive firmware for our FB Series devices contains required calculations and engineering units for API, AGA, GPA, GERG, and ISO with the gas calculations independently verified by NMi.

Fully-configurable hardware, including I/O and communication ports, allows site needs to be met much more efficiently.

Configurable tools, pre-engineered Edge Applications and IEC 61131-3-compliant FBxDesigner™ allow for process dexterity– mix all to achieve automation freedom.

Get as Much Control as You Need

Firmware-based PIDs provide dual loop control with switchover logic while Effects, Math and Action Blocks offer simple programming functionality.

Customize logic and control to fulfill unique site needs with our optional FBxDesigner software that provides access to our complete suite of powerful yet flexible IEC 61131 programs.

ProductionManager Edge Applications eliminate tedious configuration of application-specific requirements to minimize time in the field.

Empower Your Staff to Drive Results

Reduce the time required to configure and/or program devices while minimizing the likelihood of errors and the amount of training needed with a standardized, intuitive set of tools. The FB3000 RTU offers the best blend of native configurability and programmability on the market today, allowing standard to complex requirements to be met without in depth programming expertise. Easy-to-configure, out-of-the-box control tools within FBxConnect provide up to 100 instances of PIDs, Math Blocks, Action Blocks, and Effects that can be combined to achieve more complex control, including emergency shutdowns, valve control, run switching, and more. When additional control is needed, users have full access to the standard library of powerful yet flexible IEC 61131 programming tools within FBxDesigner as with any PLC. If your operation needs greater control of common processes, users can integrate our suite of ProductionManager Edge Applications that provide off-the-shelf control without tedious programming. Whether working with a single FB3000 RTU or an entire fleet, our common set of tools ensures your users can easily achieve the measurement and control needed for your operation.

Upskill Your Workforce with Easy-to-Use Tools

Setup
Automating configuration...

A structured tool set reduces the time required to configure and/or program devices as well as minimizes the likelihood of errors and the amount of training needed.

Field technicians can plan and prioritize maintenance and emergency schedules more effectively with increased access to real-time information in a secure environment.

The system keeps reports secure and users can easily compare the running configuration with the 'as left' version to rapidly pinpoint differences.

Achieve Customization without Complexity

Settings

Role 1   Role 2

Design custom displays with our optional FBxVue software that provides users with an easy-to-configure HMI at no additional cost.
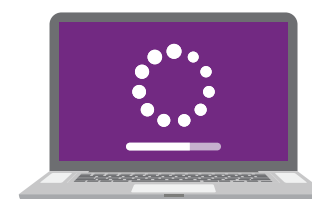
Robust user authentication and role-based security with access by responsibility allow only users who have proper credentials to modify configuration and/or programming.
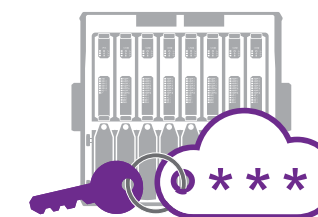
Users can quickly setup alarms with our simple alarm templates that allow the flexibility to configure by value (i.e., HiHi, Hi, Lo, LoLo) and/or rate of change.

Automate Routine Tasks

FBxConnect

FBxConnect minimizes training and improves productivity by offering a common tool for both flow computers and RTUs, including an intuitive guided setup wizard.

Electronic cloud-based licensing enables quicker deployment while an online record ensures no issues with lost or damaged dongles and chips.

Easily configure, monitor, and manage a fleet of FB3000 RTUs in FBxConnect using software-selectable I/O that helps users quickly navigate through the configuration of I/O modules.
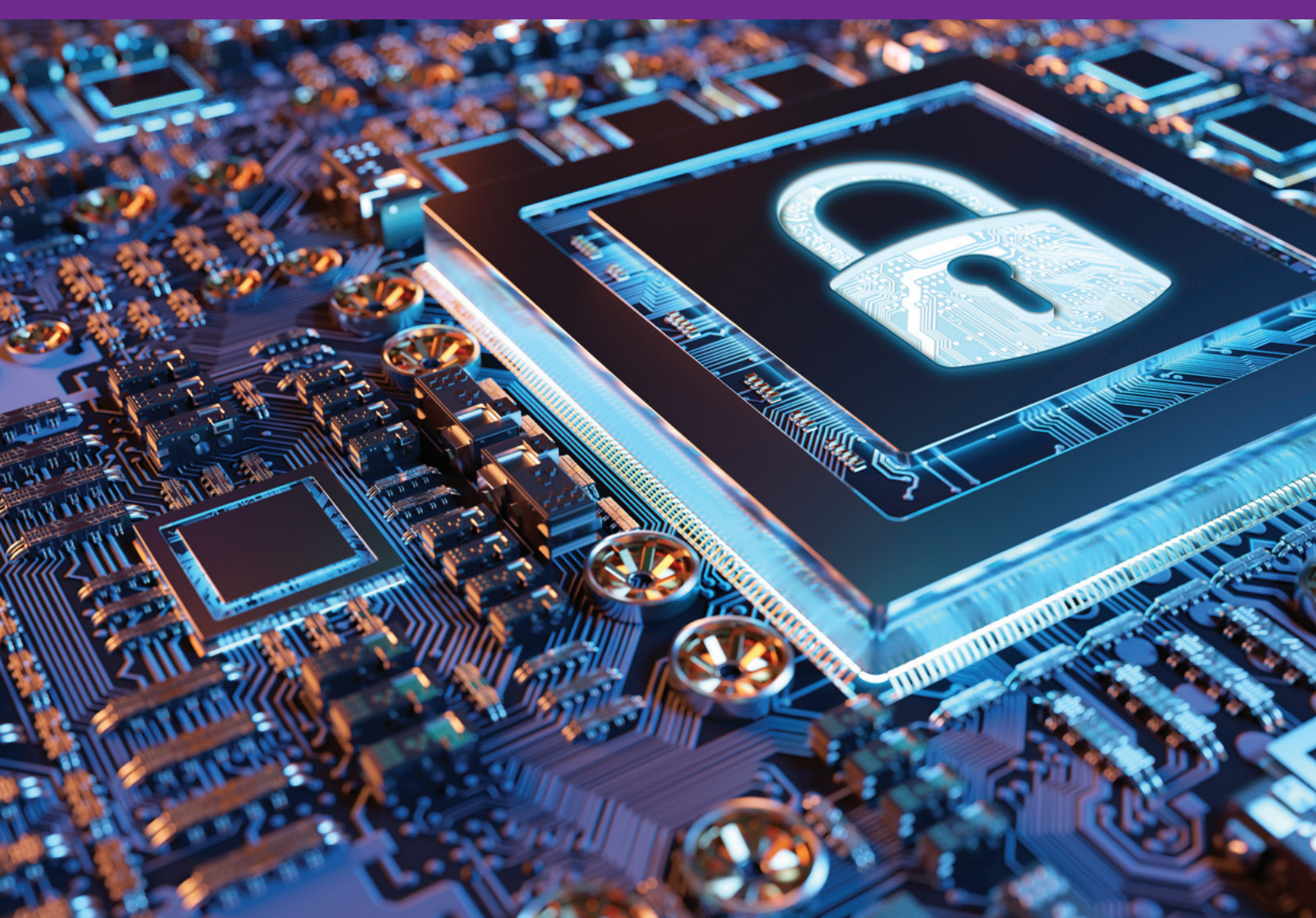
Establish a Secure, Standards-based Platform

Multi-well pads can generate vast amounts of data in a short amount of time. Automation with the capacity to efficiently handle and reliably archive this data is essential today and in the future as operations increase in size and become even more complex. The robust FB3000 RTU offers expanded archiving capabilities along with the ability to maintain a more secure infrastructure by enabling authenticated communication and controlled user access. Preserving data accuracy is also essential to oil and gas producers and the RTU's advanced logging capabilities help mitigate the possibility of human error, particularly as it relates to the audit trail. The extensive event log, with capacity for up to 8,000 events, ensures a detailed account of all setup and configuration changes. Users can also easily create a separate event log for legal and metrology events to ensure this information is readily available during an audit to save time and money.

Maintain a Secure Environment

DNP3 protocol offers authenticated communication between the client and server that is reliable, flexible and secure.
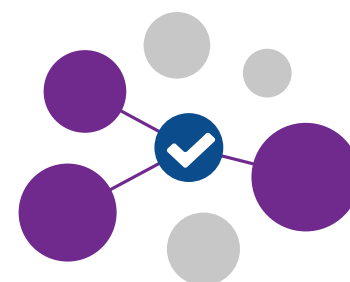
Role-based user profiles allow selectable access to the FB3000 RTU for flexible field security.
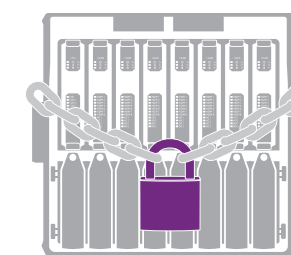
Prevention and detection of unauthorized access protects your measurement and control as well as diagnostic data.

Increase Efficiencies with a Single-vendor Platform

Enhance measurement reliability using common metrology that is part of the single, standardized firmware for the FB3000 RTU and all FB Series Flow Computers.

Eliminate third party interaction to mitigate startup delays and downtime with an integrated measurement and control automation platform that offers a native metrology set.

Streamline operations by eliminating the need for additional third-party modules to ensure measurement is fully compliant.

Gain Greater Visibility across Your Operation

During loss of signal from a transmitter or meter, ensure data availability with built-in fault tolerance that allows users to fallback to a preconfigured value or to apply the last 'good' value.

Use the optional split event log to maintain separate legal and operational event logs to expedite access to critical events during auditing.

Standardize to a single firmware version to reduce the number of firmware versions that need to be verifed between audits.

# Operate with Greater Confidence by Optimizing Well Performance

Gain greater control of common oil and gas production processes without spending hours of time on programming with our ProductionManager Edge Applications. These standardized yet flexible solutions provide off-the-shelf control to assist with managing the lifecycle of the well from flowback to abandonment, well testing for allocation purposes, and complete produced fluids management. Each field-proven application has been enhanced for the FB3000 RTU based on customer input to ensure best-in-class performance.

The FB3000 RTU's patented multi-bus backplane design provides parallel processing for faster communication of data, allowing applications, firmware, and more to run simultaneously without impacting performance.

Custom Displays that Rival Those of a Full-featured HMI

Get the power and flexibility of a full-featured HMI without incurring additional expense. Our FBxVue Custom Display Generator allows users to easily transform screens built in FBxConnect and/or FBxDesigner into custom displays to enhance decision making. FBxVue can also be integrated with the suite of ProductionManager Edge Applications to provide the same customization opportunity to gain greater visibility of application-specific content, ensuring better decision making and improved results.
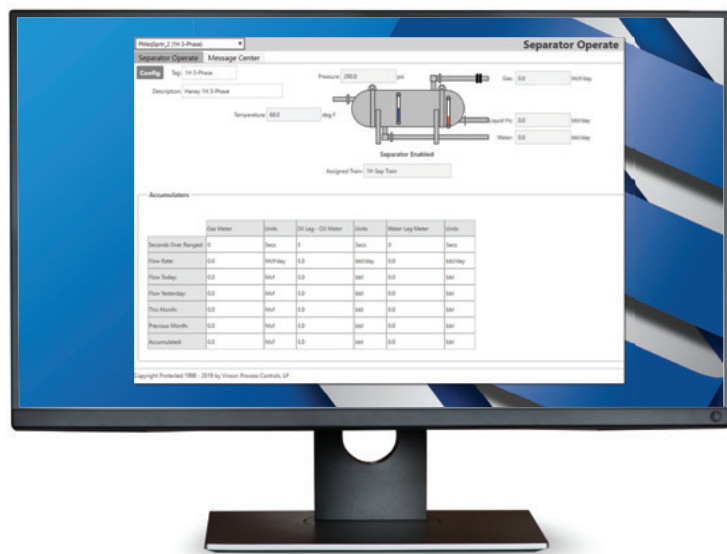
ProductionManager Equipment Module

Use this foundational application to configure once to efficiently monitor, track and diagnose the equipment installed across your site.

- Easily monitors the performance of each piece of equipment using the application's Message Center to ensure information is shared between applications
- Allows operational analysis and diagnostics of onsite equipment
- Offers advanced one-time configuration features for separators, tanks, flares, and more

ProductionManager Well Optimization

Achieve continuous, real-time optimization of production based on industry standard methods.

- Provides surface and downhole analytics, including bottom hole pressure estimation, heading detection interference, and plunger statistics
- Expedites deployment by leveraging the same well objects from ProductionManager Equipment Module
- Streamlines multi-well management with an expansive 12-well capacity

ProductionManager Well Test

Compliant with the latest API 20.5 well testing guidelines. Facilitates scheduled, automated well testing or manual well test operations to mitigate potential issues with allocation, scheduling, multiple testers, and test results.

- Simultaneously supports up to six instances of well tests based on the FB3000 RTU's CPU
- Automatically schedules well tests as needed on one tester or several with the ability to modify the schedule and insert wells for retesting as required
- Provides comprehensive, accurate reporting and ensures delivery of immediate testing reports

Digitally transform your production operation by establishing a secure infrastructure that leverages best-in-class, scalable technologies.

Emerson's latest flow computer and RTU technology platform will help your operation meet production targets, minimize lease operating expenses, and keep your data safe and secure.

Visit us online at **www.Emerson.com/FB3000RTU**

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