Optimizing Your Oil and Gas Measurement Operations

FB1000 and FB2000 Series Flow Computers

Minimize lost and unaccounted for, improve safety performance, and increase data and cyber security, all while reducing costs.

EMERSON™

Maintaining measurement integrity, meeting cost targets, and reaching safety and security goals can be overwhelming.

Too often you can face tradeoffs, and those tradeoffs could expose the company to risk, employees to harm, or make it harder to minimize lost and unaccounted for product. Maintaining the integrity of your measurement system while also enhancing safety, meeting cost targets and achieving security goals can be challenging. Keeping personnel and property safe are critical objectives, but when your team is operating over a large territory, driving from hazardous area to hazardous area, it isn't easy. Doing more with fewer resources makes it more critical than ever that your electronic devices and fiscal data are not being compromised. Delivering fiscal measurement integrity while meeting business operational objectives is within your reach.

"Traffic fatalities up as much as 1050% in high activity shale play."
– Texas Department of Transportation

"One estimate is that 30% of the existing workforce will retire in the next 5 years, and take a large slice of the operating and commissioning experience into retirement."
– Kolmetz.com

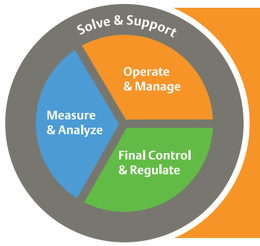
"42% of abnormal situations or upsets in processing facilities are caused by people or their work context."
– Abnormal Situation Management Consortium

"Seventy-eight percent of [Energy Sector IT professionals] said they experienced a cyber attack from an external source, and thirty percent have seen an attack from an inside employee."
–Tripwire

Instead of being distracted by frequent emergencies and problems, what if you could improve productivity and achieve the lowest cost while still protecting your people and the environment?

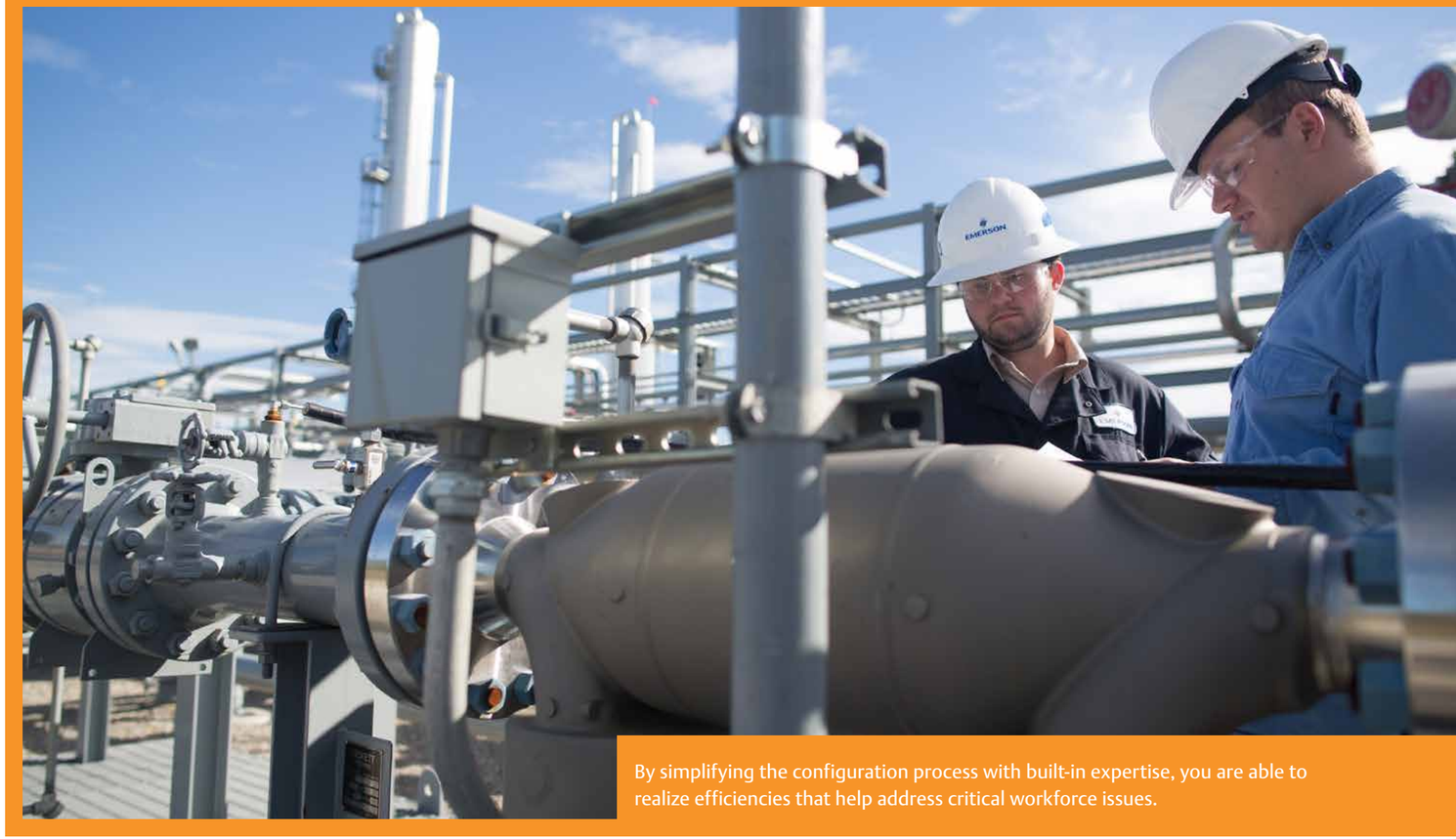
Emerson's FB1000 and FB2000 Series Flow Computers for Oil and Gas Measurement Operations

Emerson's FB1000 and FB2000 Series Flow Computers are designed to enhance your measurement operations by improving metrology performance, reducing measurement uncertainty and ensuring compliance with measurement contracts. Field engineers will notice the wide array of benefits that make their jobs easier, while management will appreciate the improved operational efficiency and peace of mind gained through improved safety and security measures.



To perform at your best, you need to continuously monitor and optimize in real time, with potential upsets addressed before they become reality. Across thousands of square miles, you need intelligent agents acting on your behalf, spanning the chasm between monitoring and decision making with the wisdom of years of experience.

Process Control • **SCADA** • **Safety & Compliance** • Operations Management
Asset Reliability • Decision Support & Data Management



By simplifying the configuration process with built-in expertise, you are able to realize efficiencies that help address critical workforce issues.

Achieve precise measurement and accounting.

Precise measurement systems enable you to control lost and unaccounted for product, minimize reconciliation work and maintain a solid reputation with your customers. Our new flow computers can help.

Accuracy ▶ p5

Reduce total costs for measurement systems.

In the modern era, we all face the same challenge: do more with fewer resources. Our new flow computers achieve this goal. By reducing the time to configure a device, the time to perform tasks in the field, and your dependence on expert resources, you can truly achieve more with less.

Efficiency ▶ p9

Keep your personnel safe and reduce incidents.

The FB1000 and FB2000 Series Flow Computers have been designed with features that keep your teams off the road and out of hazardous areas and reduce the total number of high-risk operations.

Safety & Environment ▶ p7

Maintain security and integrity of fiscal data.

Designed with IT compliance in mind from the ground up, our new flow computers make it easy to satisfy your organization's policies to establish a secure infrastructure.

Security ▶ p11

Achieve Precise Measurement and Accounting

Emerson's FB1000 and FB2000 Series Flow Computer family has a range of capabilities that make measurement systems more accurate and robust, helping reduce some of the stress of being a measurement professional. The flow computers deliver a sound measurement platform, helping to enhance your customer relations and eliminate major discrepancies.

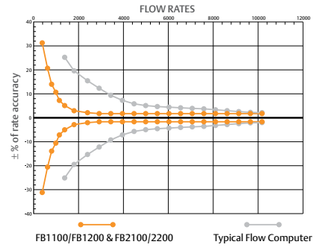
What's your challenge?

"One estimate is that 30% of the existing workforce will retire in the next 5 years, and take a large slice of the operating and commissioning experience into retirement."
–Kolmetz.com

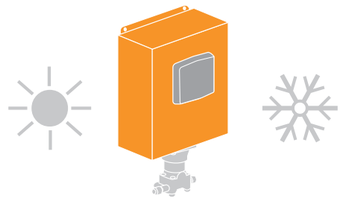
What's your opportunity?

Configuration workflows make it easier than ever to configure metering and measurement functionality, ensuring even your newest employees can do it right the first time.

Reduce Measurement Uncertainty



Inherent **accuracy of pressure and DP** sensors minimizes measurement errors in real environments.



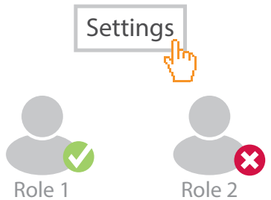
Best-in-class temperature measurement performance reduces uncertainty by 75% with sensor matching.

CALIBRATION LOG - FB1200	
2/16/2013	In spec, no cal required
2/16/2014	In spec, no cal required
2/16/2015	In spec, no cal required
2/16/2016	In spec, no cal required
2/16/2017	In spec, no cal required

Long-term stability of Emerson's sensors for DP and pressure ensures ongoing accurate measurement, long after the last calibration was performed.

Ensure Data Integrity

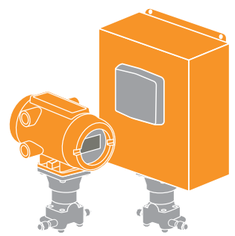
Expanded onboard data storage provides up to 365 days of secure backup of essential data to enhance the audit trail.



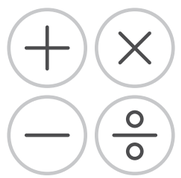
Role-based security protects metering settings.

Pre-configured operations reduce incorrect metering setup.

Easily Monitor and Prove Compliance



Single firmware version includes globally required fiscal flow and fluid property calculations.



Independently verified calculations ensure compliance to required measurement standards.

Legal events are reported separately from operational events to simplify auditing.

For more information on Emerson's Flow Computers, visit **www.Emerson.com/FlowComputers**

Keep Your Personnel Safe and Reduce Incidents

Keeping personnel and property safe are critical objectives, but when your team is operating over a large territory, driving from hazardous area to hazardous area, it isn't easy. With this in mind, the FB1000 and FB2000 Series Flow Computers have been designed with features that keep your team off the road, out of hazardous areas and reduce the number of high risk operations required.

What's your challenge?

"Traffic fatalities up as much as 1050% in high activity shale play."
–Texas Department of Transportation

What's your opportunity?

Eliminate manual operator rounds, get more done and keep your workforce away from hazardous areas by using Emerson's FB1000 and FB2000 Series Flow Computers.

Keep Your People Out of the Hazardous Area

FBxWifi™ allows a secure local connection to the flow computer from a designated safe area for monitoring, data collection and configuration.

Reduce the Frequency of Site Visits

CALIBRATION LOG - FB1200	
2/16/2013	In spec, no cal required
2/16/2014	In spec, no cal required
2/16/2015	In spec, no cal required
2/16/2016	In spec, no cal required
2/16/2017	In spec, no cal required

Reduce calibration frequency with the long-term stability of the flow computers.

Expanded history capacity makes data collection from remote sites less time critical.

12-month autonomous battery option solves power issues at remote sites where solar power may not be practical.

Respond to Alarms More Effectively

Simplified alarm architecture is more flexible and reliable with reduced nuisance alarms, improving fault detection and response.

Increased ability to diagnose issues and alarm patterns.

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Reduce Total Costs for Measurement Systems

In the modern era, we all face the same challenge: do more with fewer resources. The FB1000 and FB2000 Series Flow Computers help you achieve this goal. By reducing the time to configure a device, time to perform tasks in the field, and your dependence on expert resources, you will truly be able to achieve more with less.

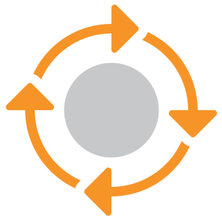
What's your challenge?

"42% of abnormal situations or upsets in processing facilities are caused by people or their work context."
– Abnormal Situation Management Consortium

What's your opportunity?

Preventing abnormal situations is the key to reducing cost impact and remedial activities. Our solutions help you avoid preventable upsets as well as recover more quickly if they happen.

Reduce Time Spent in the Field



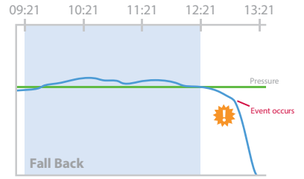
Guided workflow setup for common operations such as calibration, verification and plate changes.

Reduce work time in the hazardous area with local FBxWifi connectivity.

Long-term stability reduces the need to calibrate as frequently.

Spend Less Time Reconciling Data

Long-term stability reduces the risk of lost and unaccounted for exposures.

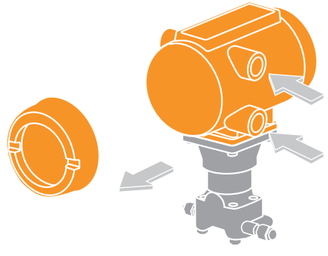


Enhanced fall-back options allow metering to continue in the event of external problems.

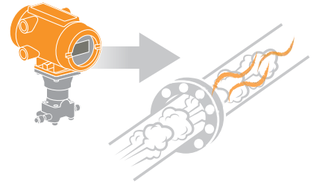
FBxConnect™ tool makes data validation easy by generating .cfx files.

Fewer Unforeseen Site Installation Issues

Low power options provide solutions where power is limited or unavailable, including solar and autonomously powered units.



Field wiring has never been easier with increased conduit entries, configurable I/O points and larger screw terminals.



Odorizers and samplers can be driven directly from the flow computer's pulse outputs.

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Maintain Security and Integrity of Fiscal Data

Our new FB1000 and FB2000 Series Flow Computers are designed from the ground up with IT compliance in mind, making it easy to satisfy your organization's policies to establish a secure infrastructure.

What's your challenge?

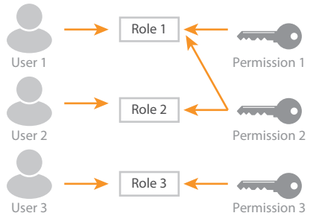
"Seventy-eight percent of [Energy Sector IT professionals] said they experienced a cyber attack from an external source, and thirty percent have seen an attack from an inside employee."
–Tripwire

What's your opportunity?

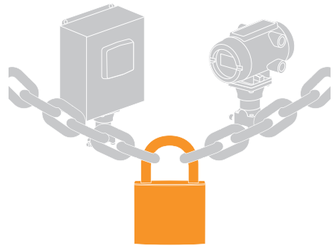
Robust security enhancements help mitigate the risks of unauthorized access. By reducing opportunities for unauthorized access, we can greatly reduce the likelihood of various attack vectors.

Customized Security Management

Robust user authentication with stronger, longer passwords and the ability to set minimum lengths.

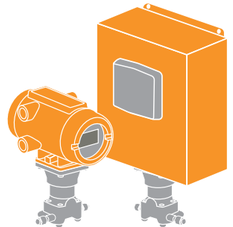


Role-based security means that users only have access to functionality appropriate for their responsibilities.



Security lockout prevents multiple login attempts by locking users out.

Secure Fiscal Calculations



A **single firmware** contains all required calculations and engineering units; no need to audit additional user programs.

Firmware authentication verifies the source of firmware and prevents firmware spoofing attacks.

Tested algorithms: flow calculations have been independently tested and verified by Notified Bodies.

Improved Auditability

Compare the running configuration with the "as-left" version in seconds to pinpoint any differences.

Split event logs to meet current best practices for separate legal and operational logs.

Extended reporting allows users to report in multiple formats (.csv, .pdf, .cfx) as needed.

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Emerson's FB1000 and FB2000 Series Flow Computers for Measurement and Control

Product overview

The versatile flow computers make it simple to meet and comply with your measurement requirements. Their versatility will help your measurement team achieve their demanding operational goals regardless of their experience level.
www.Emerson.com/FlowComputers

Key applications

- Fiscal and allocation metering
- Sales metering
- Compressor stations
- Production measurement and control
- Gas gathering

Key specifications

- Global hazardous area approvals for Class I, Div 1 / Zone 1 and Class I, Div 2 / Zone 2 applications
- Best-in-class measurement uncertainty including 5-year sensor stability
- Global calculations in firmware including AGA, API, GPA, ISO and GERG
- Compatible with Orifice, Cone, Turbine, PD, Venturi, Nozzle, Auto Adjust, Conditioning Orifice, and Pulsed Coriolis and Ultrasonic Meters
- User-configurable communication options including serial, Ethernet and FBxWifi
- API 21.1 compliant

Key Capabilities

FBxWifi™

- Through a secure wireless connection, you can use FBxConnect Configuration Software to view process values, edit configuration parameters and collect logs stored in the flow computer – all from the safe area.

Low power design

- Capable of autonomous operations for up to 12 months.

Easy-to-use process control

- Native PID loops, Boolean logic and math blocks simplify control setup.

Automated configuration software

- Designed for ease-of-use, FBxConnect provides at-a-glance monitoring, quick access to commonly performed tasks and a guided configuration process to quickly get your measurement operation up and running.

Measurement accuracy and reliability

- Equipped with the latest in sensor technology, Emerson's FB1000 and FB2000 Series Flow Computers provide high accuracy with long-term stability to help improve measurement confidence and production efficiency.

Emerson's FB1000 and FB2000 Series Flow Computer Portfolio

FB1100

- Single run flow computer that provides robust measurements for up to 12 months in an explosion-proof housing.

FB1200

- Single or dual run flow computer capable of process control for standard applications in an explosion-proof housing.

FB2100

- Single run flow computer with more options for I/O and customization in a NEMA 4/IP66 housing.

FB2200

- Single or dual run flow computer with up to 21 I/O and metering control capabilities in a NEMA 4/IP66 housing.

Meet your financial and performance objectives by improving measurement accuracy, keeping your people safe and improving workforce efficiency.

With unmatched accuracy, security, safety and wireless connectivity, Emerson's FB1000 and FB2000 Series Flow Computers will help you realize the full potential of your measurement investment.

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