



Three Key Considerations when Automating Large Wellpads



EMERSONTM



Can the Automation Scale to Fulfill Complex Site Requirements Long Term?

Multi-wellpad development in U.S. shale territories has changed the game in terms of the scope and complexity of automation required to operate these sites efficiently. This new game is prompting oil and gas companies to evaluate their approach, with increased efficiencies and standardization rising to the top of the list when designing their facilities.

While companies are seeking to invest in new technologies that will reduce costs yet maintain the necessary production levels, the technology selection process is not as clear cut as some may think it is. Making the right choice requires a thorough understanding of how an automation platform will adapt to changing site needs, particularly with ongoing market fluctuations and increased demand.

As companies look to their future in an uncertain environment, selecting the right technology platform becomes a critical decision. An engineering manager or operational leader should guide their approach by considering three important questions:

- 1. Can it scale easily and does it offer the architectural, control, and power requirements to handle large, complex sites?**
- 2. Does it offer truly integrated measurement?**
- 3. Is the automation easy to use and maintain?**

The right automation and measurement platform must meet all these considerations, enabling companies to achieve operational cost savings by reducing complexity. The platform must also allow for more flexible engineering practices while providing the tools necessary to employ truly standardized approaches across the organization and asset base. Let's explore each consideration in more detail.



Consideration No. 1 Scalability

There is an alphabet soup of existing control technologies, including RTUs, PLCs, EFMs, and SCADA. New emerging digital, IoT technologies such as edge computing, MQTT, machine learning, and cloud-based technologies are also being looked at as production companies determine their automation, SCADA, and IoT direction for the future. Much of what is happening today is blurring the lines between the different technologies. It no longer matters if a technology is referred to as an RTU or a PLC. What does matter is the capability that the automation platform offers to address the challenges of developing a standardized approach for multi-wellpad automation. One of the most important factors to consider is how easily and quickly the automation platform can be scaled across a large organization and asset base. The modern RTU, such as [Emerson's FB3000 RTU](#), offers the same key features, openness, and scalability of a PLC while providing additional flexibility, ease of use, and tools which support standardized approaches with fully integrated measurement capability.

The automation platform's ability to scale from small applications to large, complex implementations with multiple wells and distributed site assets requires the flexibility to meet greater architectural, control, and power demands. Modern controllers like [Emerson's FB3000 RTU](#) are highly scalable from a processing power and I/O perspective, reducing the footprint on the site and allowing more and more I/O and control to be in a centralized device, utilizing remote I/O.

Just utilizing remote I/O, however, may not always be the best approach. Platforms that allow distributed control and measurement around the wellpad in combination with remote I/O offer the best flexibility to handle complex pad architectures since changes are likely as the site is further developed over several years.





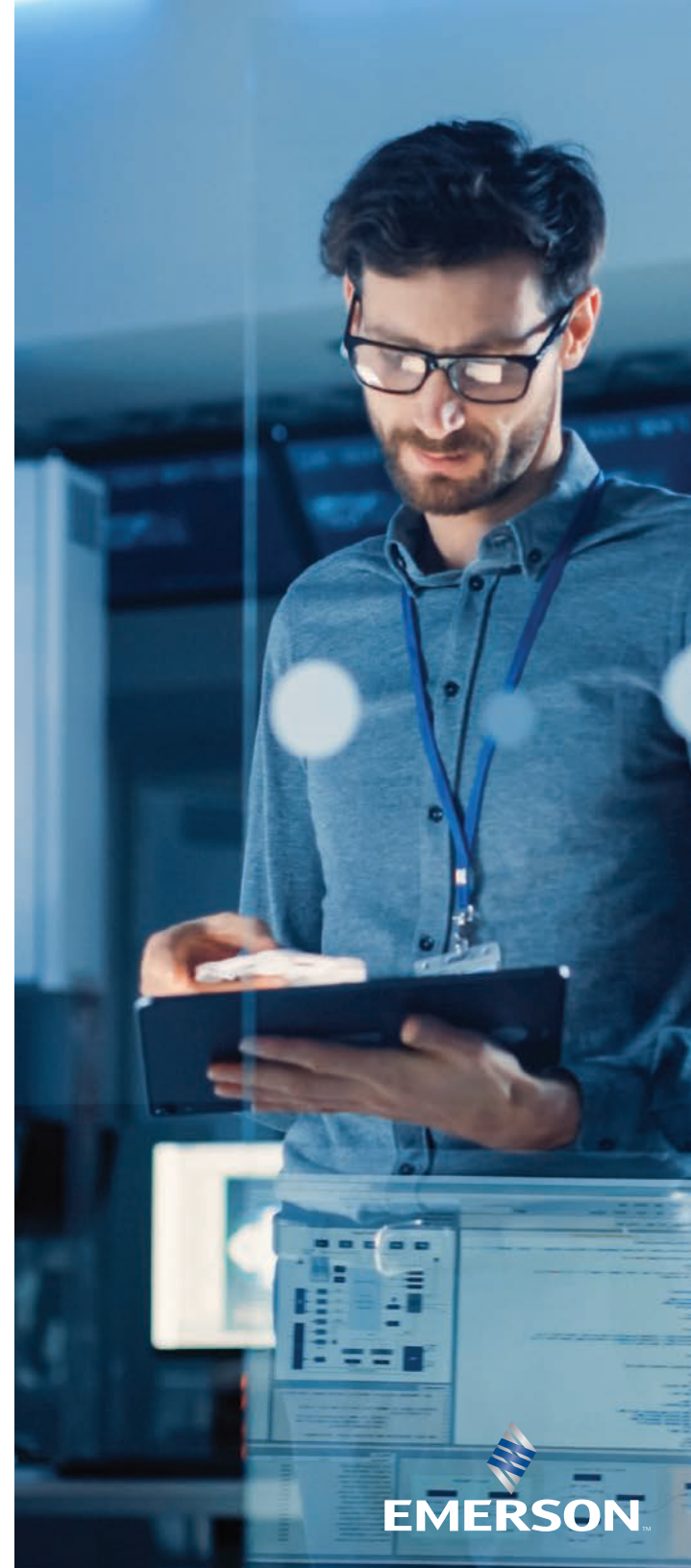
Another important consideration that relates to scalability is the control capability the automation platform has to offer. PLCs have always offered a very flexible, powerful, and open programming environment of IEC 61131 programming tools. Modern RTUs offer this same capability while going well beyond by offering additional ease of use with out-of-the-box, simple control tools that can quickly be configured instead of programmed for common applications. Cybersecure persona-based user profiles and configuration management tools are also in place, making it much easier to manage and control the application load across the assets and the organization while protecting critical infrastructure from threats and other outside influences.

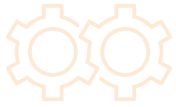
For companies that prefer not to engineer their own control load from scratch, some RTU manufacturers like Emerson have gained significant industry expertise over the last twenty years with a strong focus on core market customers in oil and gas, unlike other automation providers that are serving a wide array of end markets with the same platform. By focusing on a single industry, powerful yet

productized oil and gas applications are available to manage common needs around produced fluids management, truck hauling, and artificial lift optimization, providing companies with more options to standardize the production process around a consistent set of practices.

Finally, power requirements, while becoming less critical, are still important to understand. Controllers with lower power requirements provide additional flexibility for developing an asset over time. This approach provides the flexibility to get a production site online quickly using low power while the rest of the infrastructure buildout follows at a later date.

The ability to fulfill current requirements while enabling for expansion is an important consideration when selecting an automation platform. Achieving the necessary site architecture long term requires the right combination of scalability, as it relates to processing power and I/O, along with the flexibility to obtain as much control as needed with tools and systems that are designed with users in mind.



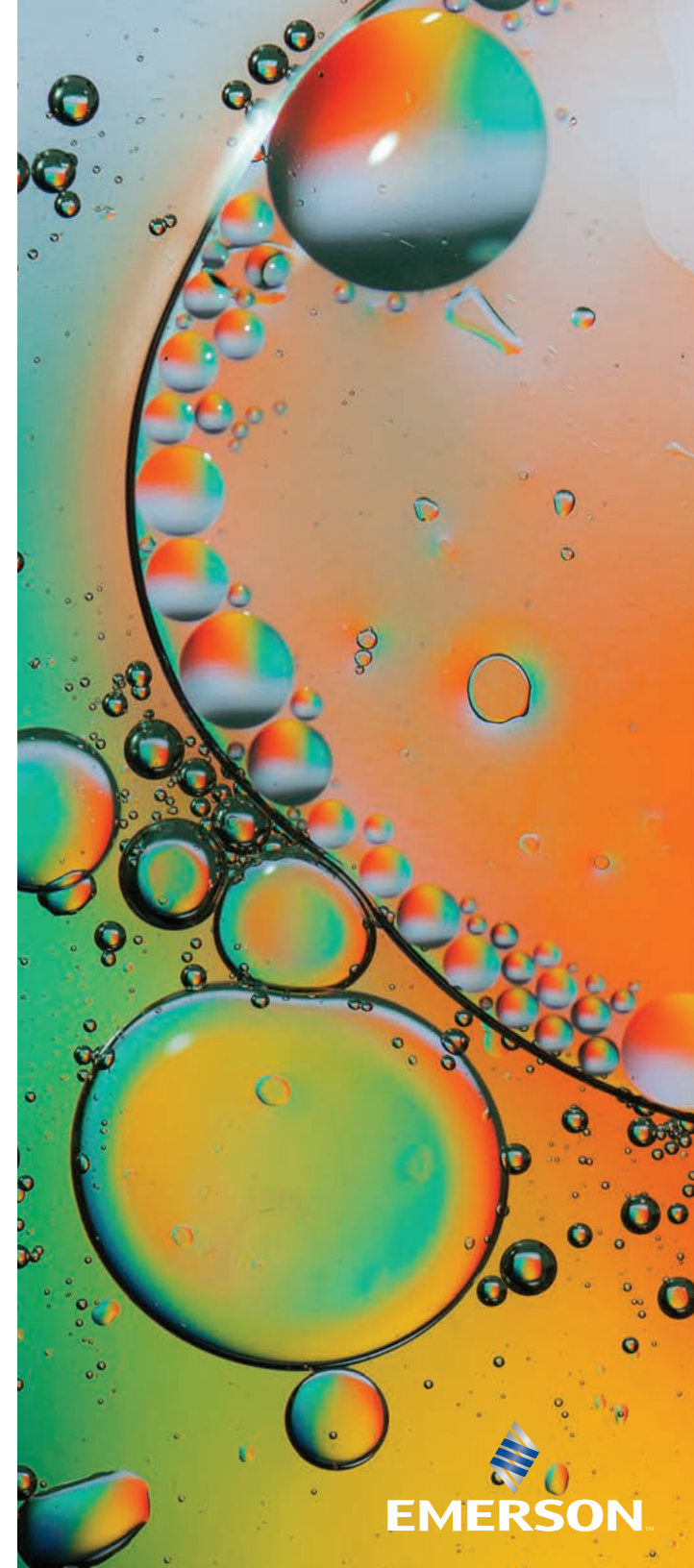


Consideration No. 2 Integrated Measurement Capability

Some automation vendors have attempted to partner with third party companies to provide EFM capability as hardware modules for their product. When evaluating a new automation platform, this approach should cause concern. Ultimately, this is still a two-vendor approach and is little different than just buying a PLC and a separate EFM device, except for the convenience factor of a footprint reduction. This multi-vendor approach is potentially introducing additional headaches and complexity that is counter to the industry direction of standardization and complexity reduction. The primary concerns are the challenges around support and technical issues when there are two different vendors involved. When problems arise, it may not be easy to determine which technology requires attention. Plus, this lack of standardization means the organization needs to invest additional time and cost to train personnel on multiple software tools. There are also supply chain complexities, including the challenges with separate sets of hardware spares.

Modern controllers with truly integrated measurement capability, like [Emerson's FB3000 RTU](#), support gas, liquids, and allocation measurement in up to 36 runs (or more) in a single CPU module. Furthermore, these capabilities are integrated as part of the base firmware with calculations that have been independently tested and verified for accuracy and regulatory compliance, ensuring data integrity. Modern controllers also offer an integrated configuration environment, a unified set of software tools, and a single hardware platform.

The opportunity to reduce complexities by streamlining to a single-vendor approach offers numerous advantages. There is much to be gained by taking a consistent approach to user training and operation since staff can be trained once to oversee a fleet of devices. New software releases can also be managed much more efficiently while maintenance practices can be applied more uniformly across a large wellpad.



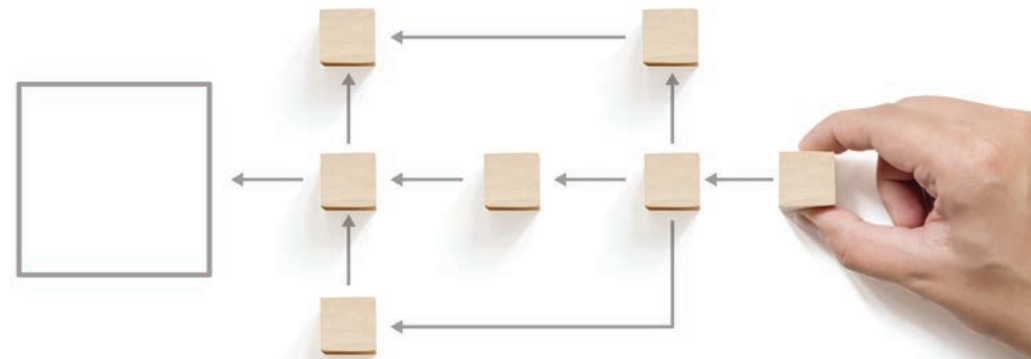


Consideration No. 3 Ease of Use and Maintenance

Oil and gas producers are constantly tasked with identifying new ways to improve productivity and reduce operating costs. The reality is many producers are managing multiple sets of measurement and control devices which is in direct conflict with their productivity and cost reduction goals. With multiple technology platforms, users need to be skilled in a variety of software tools. This scenario leads to an inherent lack of efficiency and valuable time being lost. Even more time is needed for training and upskilling to ensure personnel can efficiently configure, use, and troubleshoot a variety of devices. In addition, there is added complexity from a SCADA architecture and data management perspective, both of which impact productivity and lead to higher costs.

In today's economic environment, it is critically important to select a measurement and control platform that will reduce operating

expenses in the field. Modern RTUs offer the same capability as PLCs and allow operators to keep their process running during common maintenance practices, such as hot swapping I/O modules and editing the control load online. Modern RTUs like Emerson's FB3000 RTU continue to evolve the approach around I/O by offering optional software-selectable I/O for greater flexibility. Furthermore, new designs reduce the complexity of spares and replacements by separating termination from the I/O CPU module, giving the I/O CPU module a 'personality' through less expensive, sacrificial modules. These modules define the I/O type and are easier to maintain as spares while also reducing related costs. In addition, field personnel can be given the exact information needed by roles and responsibilities with configuration and management software that offers role-based access controls and custom displays.



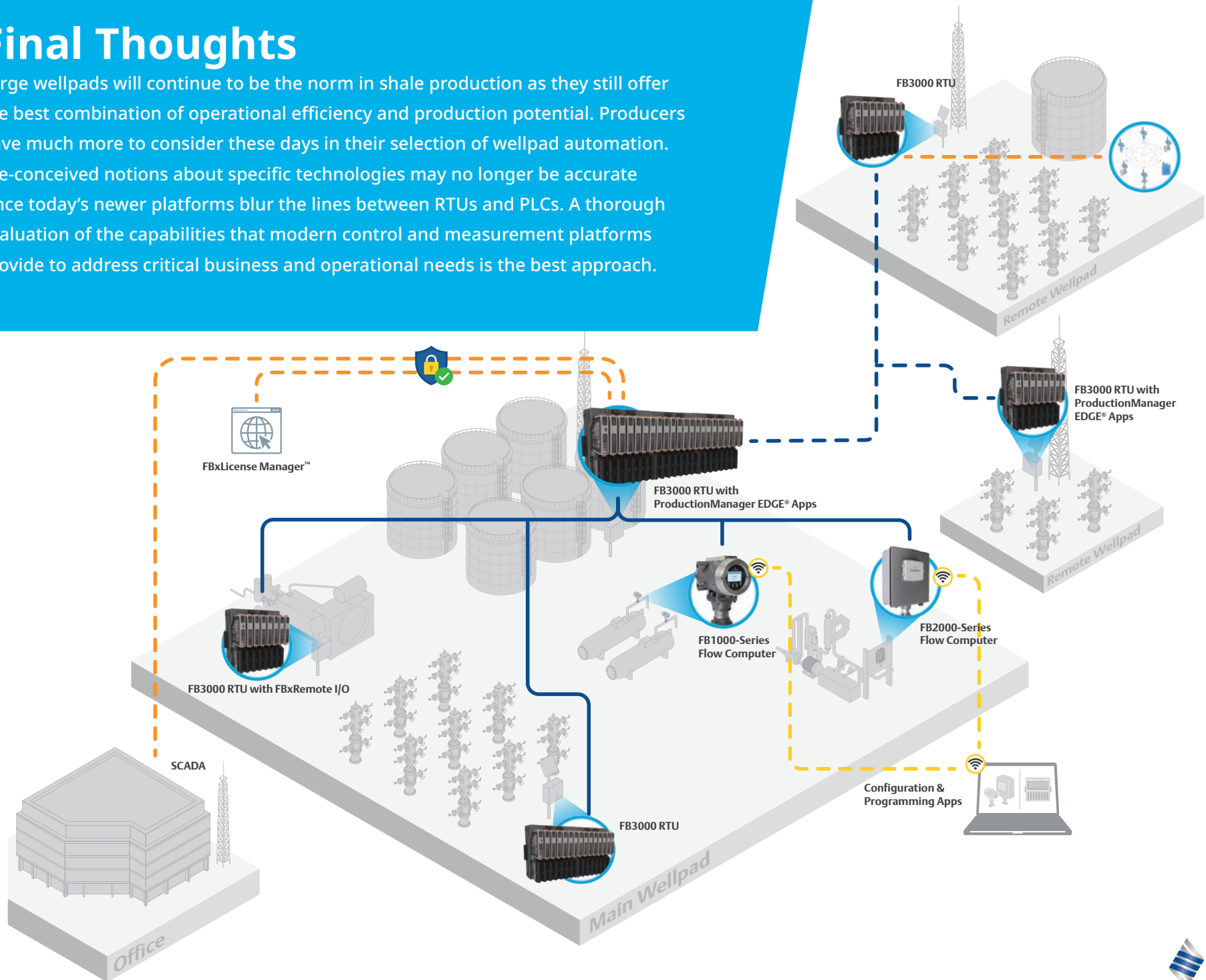
With a standardized, single-platform approach to automation, producers can optimize many tasks and procedures. The results include enhanced productivity while consistent maintenance practices will help streamline parts management and reduce operating costs.



[Click here to learn more about Emerson's FBxConnect Configuration Software](#)

Final Thoughts

Large wellpads will continue to be the norm in shale production as they still offer the best combination of operational efficiency and production potential. Producers have much more to consider these days in their selection of wellpad automation. Pre-conceived notions about specific technologies may no longer be accurate since today's newer platforms blur the lines between RTUs and PLCs. A thorough evaluation of the capabilities that modern control and measurement platforms provide to address critical business and operational needs is the best approach.



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