Digital Factory

The Integrator's Guide to Controller Replacement: Plan Your Strategy

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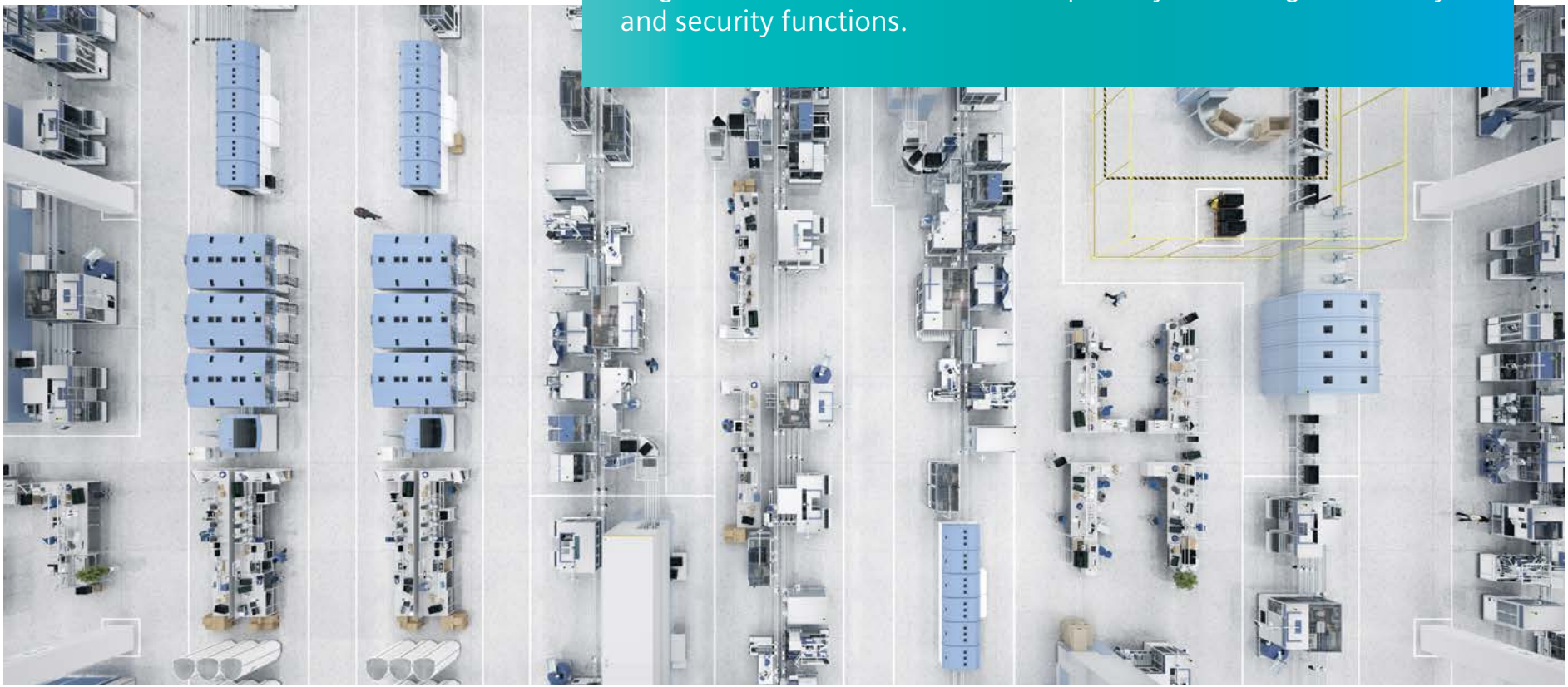
As an integrator, you're constantly seeking ways to make integration projects as seamless and cost-effective as possible. But in your quest to speed commissioning and improve efficiency with less expense, you face a confusing array of options for controllers.

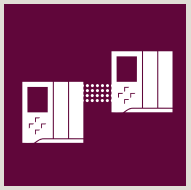
To help your clients leverage the full benefits of digitalization while growing your own business, you need a controller-replacement strategy that factors in customers' current equipment and capabilities, maintenance needs, budget and future operational goals — while maximizing your profitability.

Digitalization is the convergence of technologies, such as data analytics, the cloud and the Internet of Things, to merge the virtual and real worlds. This enables substantial productivity increases across the entire value chain, from design and engineering to sales, production and service. Digitalization can transform your plant into a "Digital Enterprise," with innovations such as no-programming diagnostics for increased data transparency, and integrated safety and security functions.



The Challenges of Controller Replacement

Here are three major hurdles that you're likely to face as you plan a controller-replacement strategy.

Challenge	Solution	
1. The need to reduce engineering time. Converting legacy code is a time-consuming process, and you and your clients need systems implemented with minimal downtime.	**Vendors should offer the following services and controller features to speed engineering time:** • No-charge code-conversion services • A single engineering framework • An overall project-management tool	
2. The need for a system that is easy to commission so you can meet customer deadlines while maximizing profits. Different global standards and poor interoperability between new controllers and existing systems can result in integration delays.	**Look for a controller with features that allow for easy integration and offer a high level of interoperability, including:** • Intuitive system functions, such as implementation wizards and drag-and-drop between editors, for fewer clicks and faster engineering • One common tag database • Online/offline comparisons	
3. The need for a smarter system that can be accessed remotely so you don't have to make repeated site visits. A lack of process information, data transparency and remote access to the system means you might have to make on-site visits to resolve issues, which cuts into profitability.	**Seek systems that provide:** • Integrated, no-programming diagnostics to quickly pinpoint issues • Remote monitoring and secured web-server access via PC, smartphone or tablet computer • Seamless and easy data-sharing capabilities	

Planning Your Controller Replacement Strategy

To address these challenges, there are a number of key attributes, including integrated controller functionality, that you should consider when selecting a new controller or vendor. Below are three guidelines for planning your strategy.

1. Select a controller that helps you to reduce clients' engineering time while minimizing downtime.

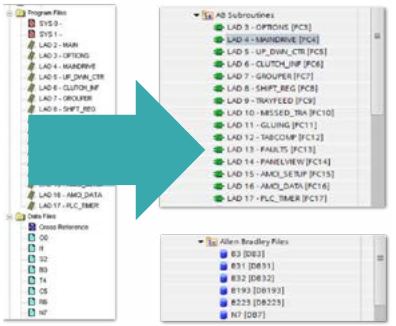
Even newer versions of existing controllers may require time-consuming code conversion. Bringing together disparate systems and components — and then monitoring or programming them — can lead to significant downtime. The most advanced controllers come with simplified integration and management tools.

Look for the following features and services to help reduce engineering time:

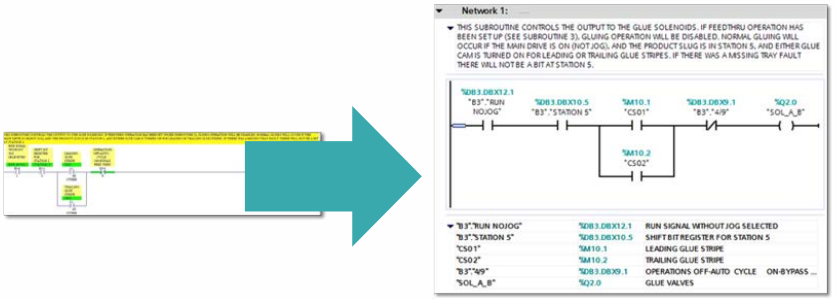
- A single engineering framework that seamlessly integrates controllers, distributed I/O, HMI, drives, motion control and motor management. Siemens TIA Portal can reduce engineering time by up to 30%.
- An overall project management tool that allows the complete system (multiple controllers, HMIs, networks, etc.) to be programmed, monitored, saved and stored, all in one software package
- Siemens offers no-charge code-conversion services, as well as HMI tag converters, I/O conversion tools, control-product cross references and guidelines for selecting replacement parts. Siemens TIA components are designed with the ability to integrate with other brands, regardless of the replacement path. For example, when replacing HMI systems, conversion tools in the TIA Portal allow for existing process data to be saving valuable engineering time and effort. When overlaying a legacy PLC system with a new Siemens solution, the Migration Studio can convert and mimic the functionality and behavior of older systems to help minimize the learning curve for engineers and maintenance technicians, and reduce future engineering time.

Totally Integrated Automation (TIA) is an open system architecture that covers the entire production process and offers maximum interoperability across all automation components. This is accomplished by the following shared characteristics: consistent data management, global standards, and uniform hardware and software interfaces — which minimize engineering time, reduce costs and boost flexibility.

The TIA Portal is a single engineering framework that seamlessly integrates controllers, distributed I/O, HMI, drives, motion control and motor management. The TIA Portal offers no-programming diagnostics, seamless program logic and intuitive functions, such as implementation wizards and drag-and-drop between editors.

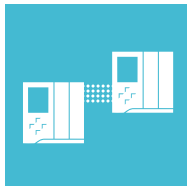


Siemens Migration Studio converts projects to state-of-the-art TIA Portal (S7-1200 or S7-1500), retaining your current structures and naming conventions, allowing familiarity from the start!



Ladder logic is still ladder logic. All comments are retained.

Tags names are identical and comments are retained.



2. Select a controller with features that allow for easy integration and offer a high level of interoperability.

Many controllers lack the features you need to easily integrate with existing systems or components. The result is extended lead times and lost profits.

Look for the following features to help make the integration process seamless:

- Easy-to-use, intuitive system functions, such as implementation wizards and drag-and-drop between editors, for fewer clicks and faster engineering
- One common tag database for fewer mistakes
- Additional time-saving functions, such as online/offline comparisons, pictorial system view with online diagnostics, no-PC-required trace functions and the ability to make code modifications while in "run" state without stopping the PLC

Common data management and consistent project-wide symbols are critical for integrators who want smart, intuitive systems that reduce engineering effort. With common databases, data is always up-to-date and available wherever it's needed. For example, if a tag is changed at any point in the project, the software will automatically adapt all other usage locations of the tag. The software automatically creates a list of all the object usage locations and keeps it up-to-date. Navigation throughout the HMI screens is easy and fast, and powerful "undo" and "redo" functions are standard.

3. Select a controller that provides remote access to give you transparency into system performance and minimizes on-site visits, improving your profitability.

Many configuration issues can be resolved remotely with access to advanced diagnostic and monitoring functionality, such as:

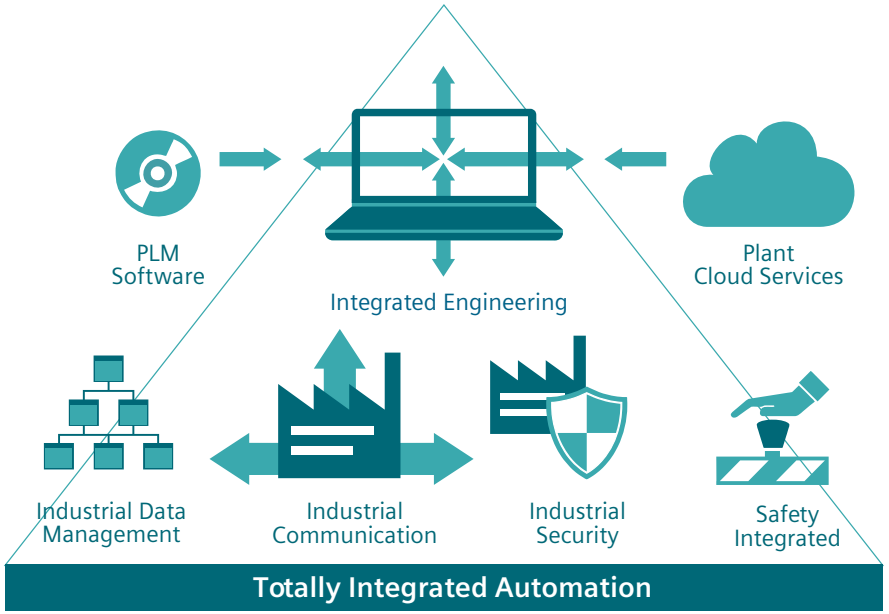
- Integrated no-programming system diagnostics, automatically generated during device configuration
- Pictorial system view with online diagnostics
- Remote monitoring and secured web-server access via PC, smartphone or tablet
- Code modifications without stopping the PLC
- Integrated trace, offering graphical representation of process diagnostics within the controller
- Compatibility with current installed controllers through built-in communication options and connections to share data via EtherNet/IP without code modifications
- Integrated safety, offering a single controller, communication and programming environment for standard and fail-safe controllers
- Integrated security for built-in protection against illegal copying and manipulation of the project, to unauthorized access of the process directly at the controller itself
- Flexibility to support various network protocols, including Ethernet, PROFINET, ModBus TCP, Profibus, etc. and easy interfacing with EtherNet/IP
- Application-specific libraries and examples for the creation of corporate standards
- Interoperability of system-tested components, which improves overall performance

The Siemens Solution for Modernizing with Ease

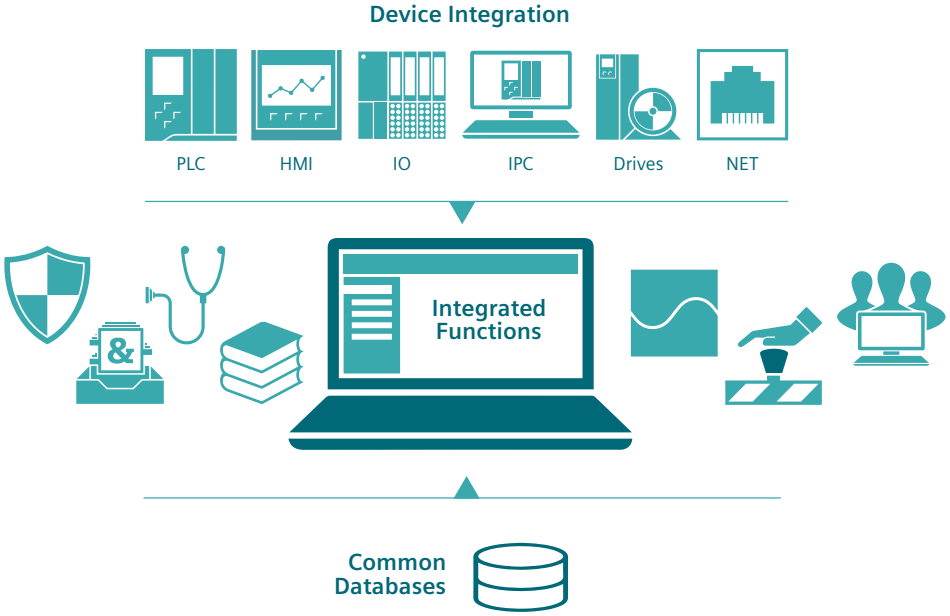
More broadly, Siemens helps system integration professionals address the challenges of controller replacement through Totally Integrated Automation (TIA) — a digitally driven, total-systems approach that increases productivity and efficiency through better machine performance, rapid diagnostic capabilities, high system flexibility and improved access to data.

TIA optimizes the entire manufacturing process, leading to faster commissioning by:

- Minimizing downtime through applying integrated diagnostic functions
- Improving engineering efficiency for lower design costs
- Boosting production flexibility through the use of integrated communication tools
- Enhancing plant and network security through integrated security functions
- Improving safety with technologies that protect personnel, machinery and the environment
- Optimizing data quality with a single, streamlined database
- Improving access to data for smarter decisions
- Simplifying implementation of automation solutions with global standards



The key to unlocking the full potential of TIA is our TIA Portal — a single engineering framework that seamlessly integrates controllers, distributed I/O, HMI, drives, motion control and motor management. The TIA Portal offers no-programming diagnostics, seamless program logic and intuitive functions, such as implementation wizards and drag-and-drop between editors.



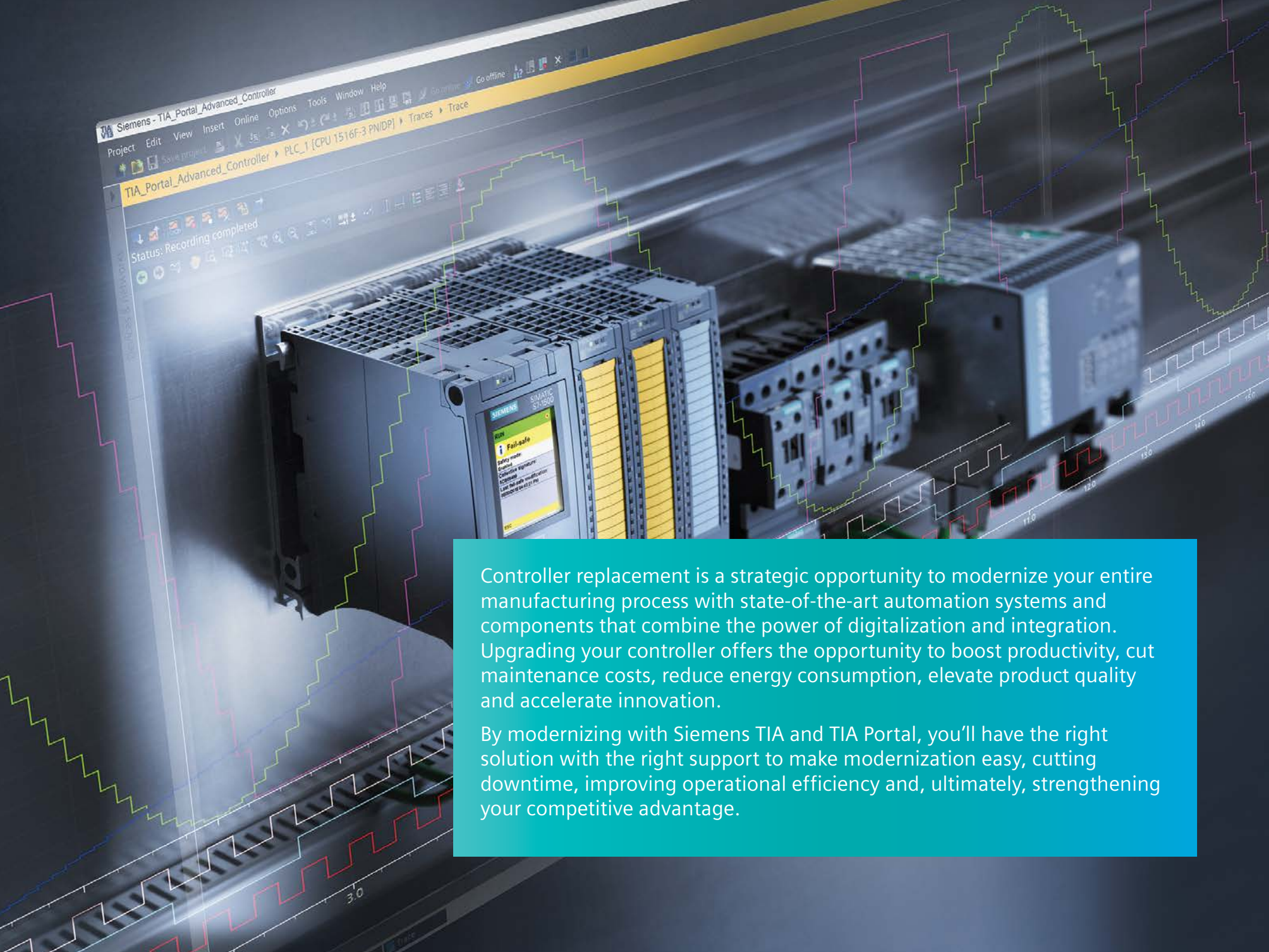
Increase your **engineering efficiency** — up to 30% across the design, commissioning and maintenance phases as determined by users.

Significant TIA Portal features and benefits that enable you to reduce your engineering time while increasing your level of transparency and flexibility include:

- An overall project management tool that allows for complete system (multiple controllers, HMIs, networks, etc.) to be programmed, monitored, saved and stored all in one software package
- One common tag database for fewer mistakes
- Ability to create custom libraries to be shared across your corporate servers for easy creation of company standardization for projects
- Easy-to-understand faults that are automatically displayed on the HMI, web server and controller, allowing problems to be diagnosed before leaving the tool crib
- Additional time-saving functions, such as online/offline comparisons, pictorial system view with online diagnostics, no-PC-required trace functions and the ability to make code modifications while in "run" state without stopping the controller

The TIA Portal takes advantage of the fact that all Siemens devices are engineered at the firmware level to share information with each other. The controller knows the state of every device on the network automatically, without engineers having to write any programming. Since this is independent of the program, these functions continue even when the system is in stop mode. Problems within the system appear automatically to the operator describing exactly what's wrong, such as a wire break on I/O Card 6, Channel 2.

Pictorial diagrams offer a bird's-eye view of complex networks by showing how all the devices are interconnected. These diagrams can become active even when the equipment is in operation, providing a clear, real-time picture of what's happening on the networks. When faults or connection problems occur, the diagram pinpoints exactly where they are in the actual equipment.



Controller replacement is a strategic opportunity to modernize your entire manufacturing process with state-of-the-art automation systems and components that combine the power of digitalization and integration. Upgrading your controller offers the opportunity to boost productivity, cut maintenance costs, reduce energy consumption, elevate product quality and accelerate innovation.

By modernizing with Siemens TIA and TIA Portal, you'll have the right solution with the right support to make modernization easy, cutting downtime, improving operational efficiency and, ultimately, strengthening your competitive advantage.

Contact Siemens today for a free consultation!

Locate a Siemens Migration Partner near you by calling **1-888-454-4704** or visiting the web:

- Siemens Sales Representative: **usa.siemens.com/saleslocator**
- Siemens Distributor: **usa.siemens.com/distributorlocator**
- Siemens Solution Partner: **usa.siemens.com/solutionpartnerlocator**

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