

A man with dark hair, wearing a brown suit jacket over a white shirt and a patterned tie, is looking down at a smartphone he is holding in his hands. He is standing in a factory or industrial setting, with blue structural beams and blurred lights in the background. The overall tone is professional and focused.

SIEMENS

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Digital Factory

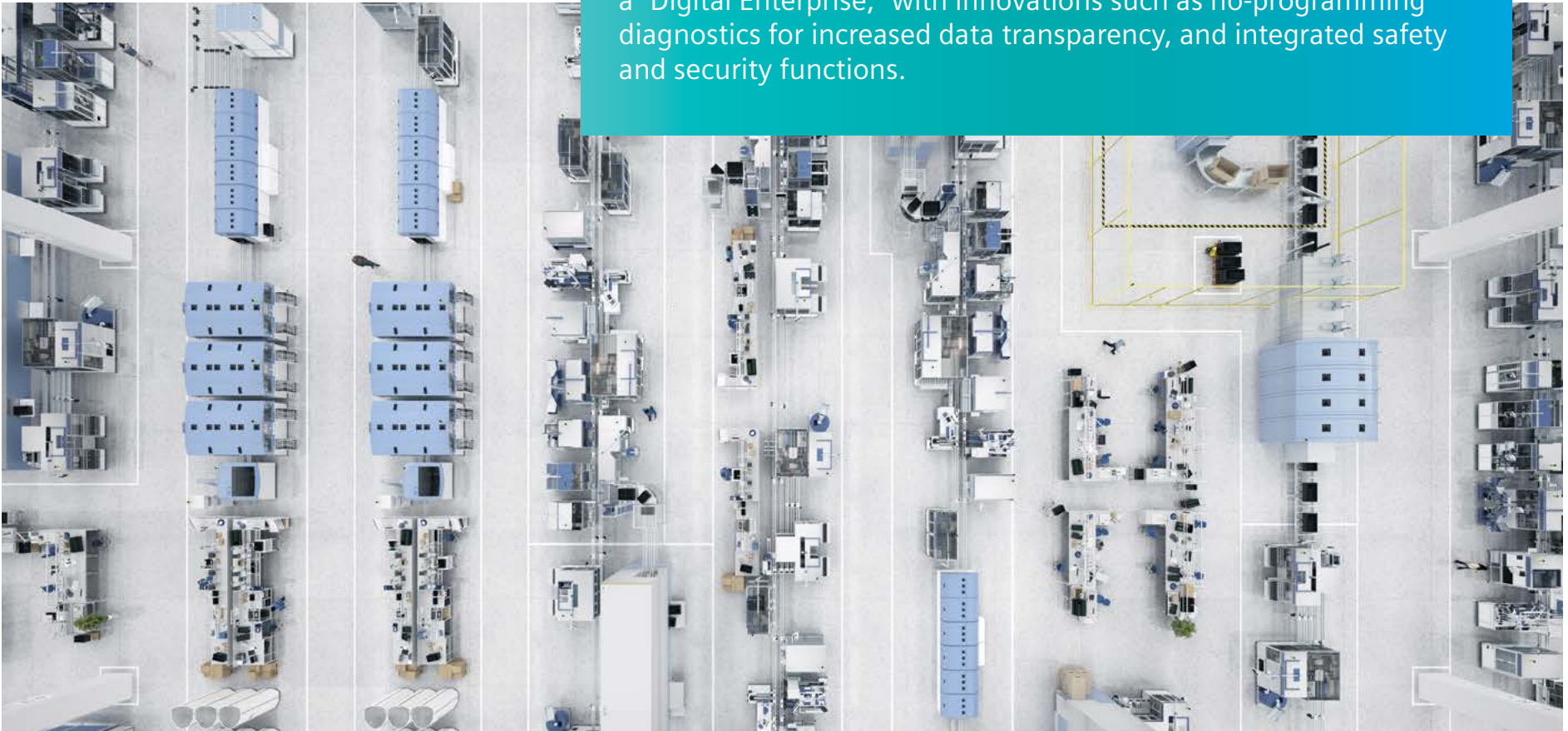
The Manager's Guide to Controller Replacement: Plan Your Strategy

usa.siemens.com/modernize

As a plant manager, you're constantly seeking ways to maximize return on investment. But in your quest to boost ROI, you face a confusing array of options for replacing underperforming or outdated controllers.

To leverage the full benefits of digitalization, you need a controller-replacement strategy that factors in your current equipment and capabilities, maintenance needs, budget and future operational goals.

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

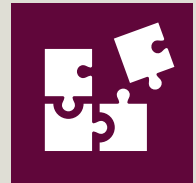
Solution

1. The need to minimize downtime during replacement to avoid productivity losses.

You know that an upgrade is critical, but you're worried that changing to a new controller will require downtime.

Use a vendor that offers a stepped or phased approach, which will allow you to retain your current level of productivity during implementation. Also, minimize downtime with products that offer the following features:

- Automatic diagnostics capabilities
- Uniform hardware and software interfaces
- Consistent data management



2. The need for future-focused, long-term solutions that stay within budget.

The planning and costs associated with upgrades can be stressful and lead to concerns that new investments won't be compatible with future technological advancements.

Look for a vendor offering products that:

- Are early in their lifecycle
- Are digitally optimized, with features that will provide maximum ROI today and tomorrow
- Provide a single engineering framework that seamlessly integrates controllers, distributed I/O, HMI, drives, motion control and motor management

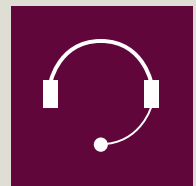


3. The need to ensure the new system doesn't require extensive training.

Switching to a new controller may require costly, time-consuming training sessions to get engineers and maintenance staff up-to-speed.

Partner with a vendor that offers:

- Controllers with implementation wizards and drag-and-drop between editors for fewer clicks and faster engineering
- No-charge 24/7 technical support until product maturity
- No-charge code-conversion services to retain your current project structures



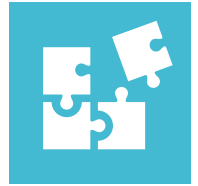
Planning Your Controller Replacement Strategy

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



1. Select a controller that requires minimal downtime.

Advances in controller technology ensure minimal downtime by enabling seamless integration and interoperability across all automation components. Built-in safety, diagnostics and communications functions also make integration with existing infrastructure smarter and even more hassle-free.



To be sure your new controller is giving you the features you need to maintain productivity, look for an option that has:

- Native PROFINET, PROFIBUS, Modbus, Modbus TCP, TCP/IP and Open Ethernet protocols for controlling and sharing of data
- Flexibility to support various network protocols, including PROFINET and EtherNet/IP, for connections to existing controllers without any code modifications to the installed controllers
- Integrated communications tools for more production flexibility
- Common database for easy access into data and tags for reduced engineering effort
- Uniform hardware and software interfaces
- Built-in safety and diagnostics functions to eliminate the need for additional programming of production critical data
- The option to implement controllers using a stepped or phased approach based on your production requirements

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.

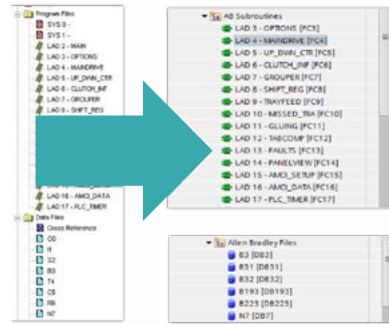
The TIA Portal is a single engineering framework that seamlessly integrates controllers, distributed I/O, HMI, drives, motion control and motor management. The TIA Portal offers no-programming diagnostics, seamless program logic and intuitive functions, such as implementation wizards and drag-and-drop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

Common data management and consistent project-wide symbols are critical for plant managers who want smart, intuitive systems that reduce training costs and 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.



2. Select a vendor that provides solutions capable of adapting to your future needs without additional investment.

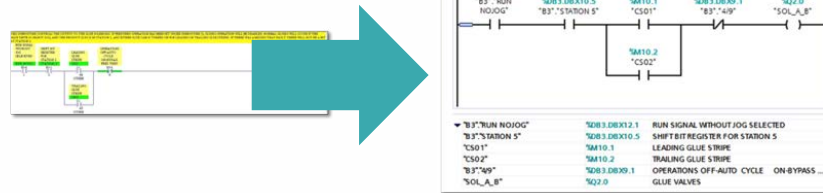
Siemens Migration Studio converts projects to state-of-the-art TIA Portal (S7-1200 or S7-1500), retaining your current structures and naming conventions, allowing familiarity from the start!



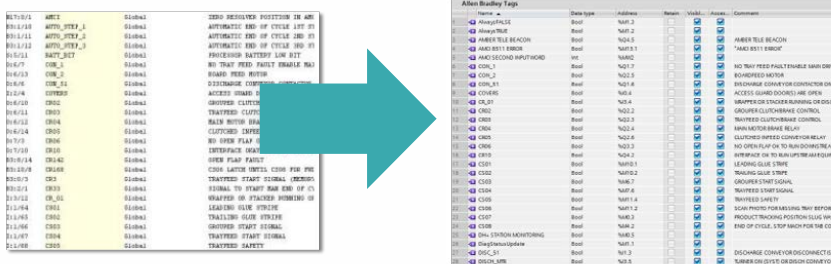
You need to upgrade your controllers, but technology is continually changing. What happens if your new controllers become obsolete in a few years? These are concerns you must address before making a significant investment. To ensure maximum ROI, choose an automation solution partner that takes a future-focused approach to automation and paves a clear and easy path toward digitalization.

- Siemens offers controllers that are early in their lifecycle and are engineered to migrate seamlessly into future technologies. In addition to no-charge code-conversion services, Siemens controllers feature 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 imported into the configuration tool. When overlaying a legacy PLC system with a Siemens solution, custom libraries developed within the TIA Portal can mimic the functionality and behavior of older systems.

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



Tags names are identical and comments are retained.



3. Select a vendor that provides immediate service and support to avoid costly and time-consuming training, and whose controllers offer intuitive features that flatten the learning curve.

You're bound to have inquiries about functionality, handling and fault clearance as you move to more modern controllers. Your vendor should be immediately available whenever you need answers.



Siemens minimizes the resources needed for training through:

- No-charge basic technical support until product maturity, access to a global network of specialists, and local Application Engineers in your area to allow you to keep your systems running
- Comprehensive service and support. With a presence in 190 countries, Siemens has a worldwide network of resources that

includes more than 50,000 specialists in automation, drives, networks, safety, motion control and motor management, across every application and industry. Technical and engineering support specialists provide 24/7 advice and answers for all inquiries about functionality, handling and fault clearance of Siemens industrial products and solutions — via phone, email, support request and remote access. Services also cover obsolete and discontinued products.

- No-charge code-conversion services
- Easy-to-use, intuitive system functions, such as implementation wizards and drag-and-drop between editors, for fewer clicks and faster engineering
- The TIA Portal, which retains your current structures and naming conventions, allowing for familiarity from the start

You may want to consider taking a phased approach to modernizing your controllers. This allows you to upgrade to the latest automation technology on *your terms*.

In a phased approach, your plant can decide where to start the modernization process — whether it's with legacy controllers, HMI panels, drives, I/O modules or other components — and can make the replacement process fit into your current shutdown schedule. Be sure your vendor offers advanced controllers that can coexist with your existing controllers while still enhancing performance.

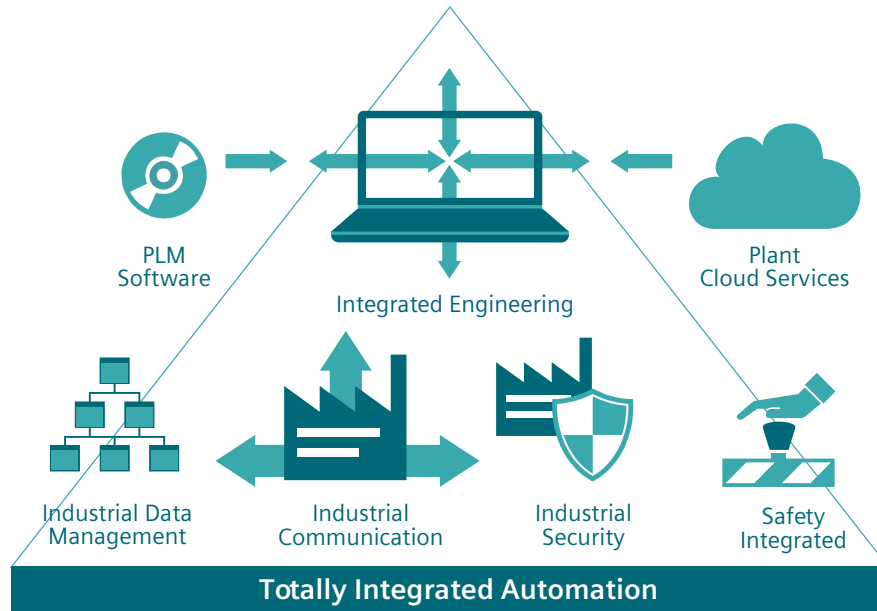
The Siemens Solution for Modernizing with Ease

More broadly, Siemens helps management 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.

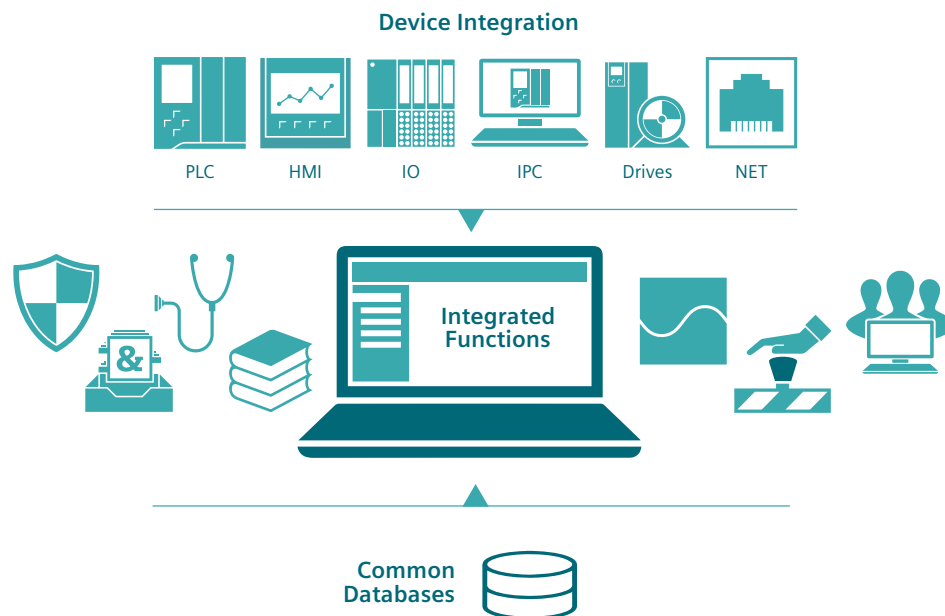
TIA optimizes the entire manufacturing process, leading to maximum ROI and improved productivity by:

- Minimizing downtime by 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
- Improving overall performance through the interoperability of system-tested components

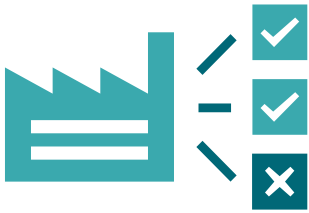




The key to unlocking the full potential of TIA is our TIA Portal, a single engineering framework that offers no-programming diagnostics, seamless program logic and intuitive functions, such as implementation wizards and drag-and-drop between editors.



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



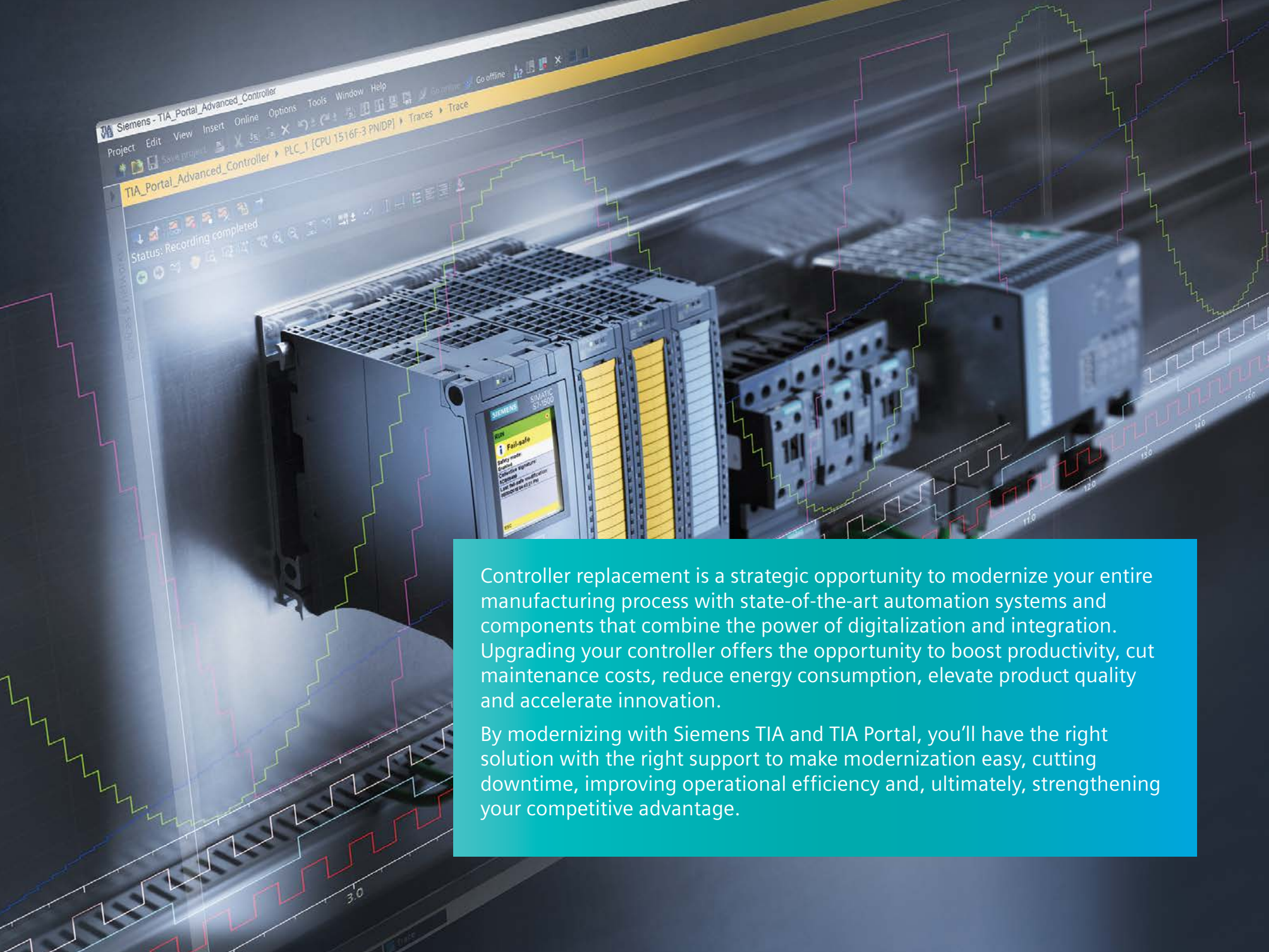
Significant TIA Portal features and benefits that enable you to minimize training and maximize ROI include:

- Integrated “no-programming” system diagnostics, automatically generated during device configuration
- Ability to create custom libraries to be shared across your corporate servers for easy creation of company standardization for projects
- 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
- 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

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 on the network appear in the pictorial diagram 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.

Siemens provides automation and drive products with industrial security functions that support the secure operation of plants or machines. They are an important component in a holistic industrial security concept. With this in mind, our products undergo continuous development. We therefore recommend that you keep yourself informed with respect to our product updates and that you use only the latest versions. Please find further information on this subject at:

support.automation.siemens.com.

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

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Siemens Industry, Inc.
5300 Triangle Parkway
Norcross, GA 30092

**For more information, please contact
our Customer Support Center.**

Phone: 1-800-241-4453
E-mail: info.us@siemens.com
usa.siemens.com/modernize

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