

Your gateway to automation in the Digital Enterprise

Totally Integrated Automation
Portal

siemens.com/tia-portal



Digital Workflow



Integrated Engineering



Transparent Operation

TIA Portal – more than an engineering framework



Totally Integrated Automation Portal (TIA Portal) enables complete access to the entire digitalized automation, from digital planning and integrated engineering to transparent operation. As part of the Digital Enterprise Software Suite, it joins PLM and MES in rounding out the comprehensive offering from Siemens for companies on the path to Industrie 4.0, making it the perfect access to automation in the Digital Enterprise.

With TIA Portal, machine builders and system integrators as well as plant operators will benefit from:

- shorter time to market thanks to innovative simulation tools, among other things
- increased plant productivity thanks to additional diagnostic and energy management functions
- greater flexibility thanks to coordinated team-work

Open, virtual and connected

Digital workflow with TIA Portal

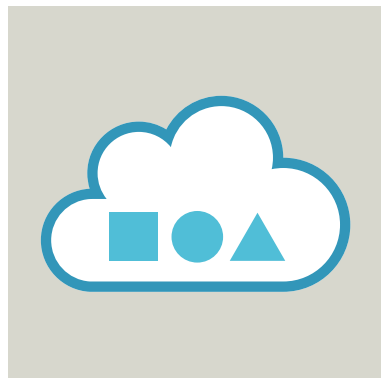
“The ability to simulate machines gives me security in design, security in sales and security in machine configuration.”

Rainer Feuchter,
CEO Optima Consumer GmbH



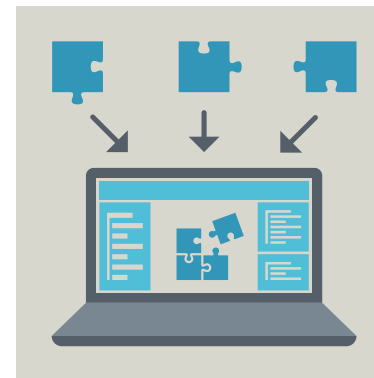
Flexible simulation

By simulating the entire installation, including the controller and HMI, and by evaluating it based on a virtual model, local commissioning time is reduced thanks to PLCSIM Advanced, the controller's digital twin.



Seamless connectivity

The cloud offers new possibilities in engineering as well as for the operation of plants. TIA Portal Cloud Connector makes it possible to work with TIA Portal regardless of the location or device. For you, this means greater flexibility and less installation effort. During operation, you can benefit from additional digital services thanks to the connection of plants to the Siemens MindSphere Cloud.



Open system

TIA Portal allows you to efficiently create your project using software generators, thus reducing the number of redundant workflows. With Teamcenter, you also merge the project versions from planning, engineering and design.

Shorten your time to market

Integrated engineering with TIA Portal

“You work with a team-enabled, fully integrated tool landscape with access to a complete portfolio of necessary control and drive components.”

Andreas Martin Linck,
Head of E-Technik



One for all

With TIA Portal, you integrate all important components of your automation project: safety, security, control, HMI, drives, distributed I/O and now even motion control and power distribution. With only a few multiple entries, a shared database and a standard interface across all tasks, your engineering time is reduced.



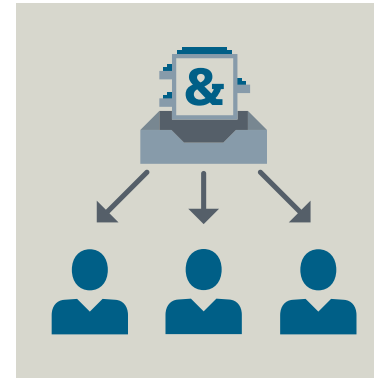
Coordinated teamwork

With TIA Portal Multiuser Engineering, multiple people can access a project at the same time. Synchronization is automatic. You can flexibly process tasks and complete them simultaneously – both device-oriented and task-based.



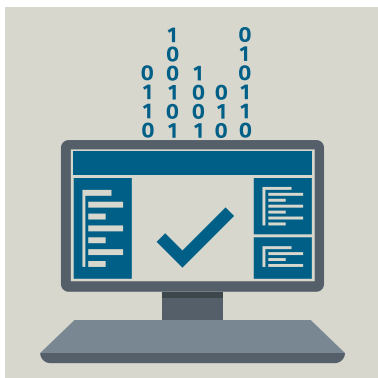
Reliably avoid errors

You reduce the amount of extra work by reliably identifying errors and quickly correcting them with numerous programming code templates. Many new and efficient diagnostic tools as well as cyclical system test recordings provide help in analyzing sporadic errors during commissioning.



Handle know-how safely and efficiently

Thanks to the comprehensive library concept, you can easily reuse all project objects and thus avoid extra work. Safeguard your specialist knowledge over the long term with know-how-protected blocks, and easily further develop existing systems and projects in TIA Portal.



Generation instead of programming

Develop your solutions even faster thanks to automatic generation of HMI visualization with SiVArc, fast and easy machine and plant diagnostic, efficient energy management system implementation as well as automatic program creation using software generators that are linked via the TIA Portal Openness interface.

Increase your productivity

Transparent operation with TIA Portal

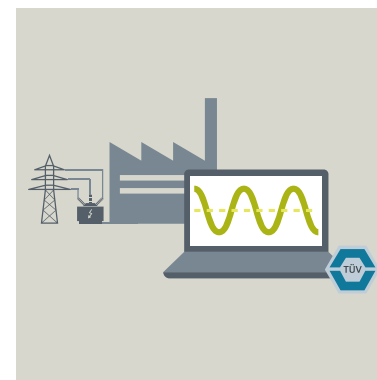
"A standard engineering platform is desirable for engineering energy efficiency systems: consistently from the device to the configuration to data storage, all the way to the customer's desk."

Stephan Vömel,
Proprietor and managing director, Quintec Automatisierungs- und Datentechnik GmbH



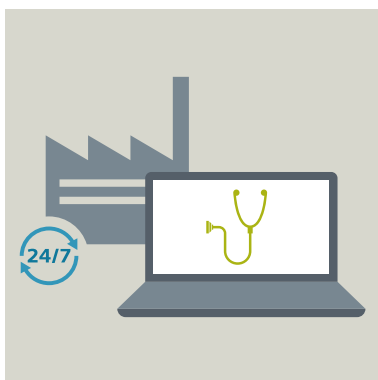
Information management

The greatest possible transparency through consistent data storage in production lets you make the right decisions quickly. You can prepare data according to specific target groups with SIMATIC Information Server locally or on a mobile device when you are in the field. The system supports WinCC/WebUX as well as WebNavigator for remote access and control.



Energy management

The integrated SIMATIC Energy Suite automation solution, the S7 Energy Efficiency Monitor, and the universally connected Energy Manager energy management system help you get a handle on your energy costs at all times. The Energy Suite makes energy data record easy and efficient and gives you the transparency you need to save energy according to ISO 50001.



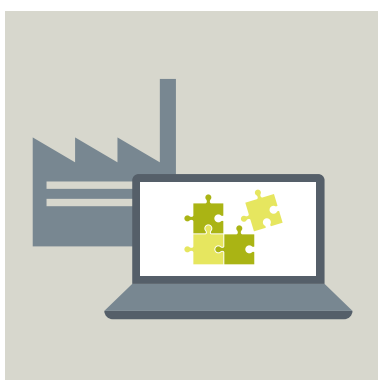
Diagnosis management

Efficient and integrated diagnosis of process errors reduce production downtimes and increase the availability of your machines and plants. The standardized ProDiag machine and plant diagnostic function gives you efficient analyses of process errors. Integrated system diagnosis helps you quickly identify errors in the automation system across all system components.



User management

Efficient user management is a key part of every security concept. User management in the TIA Portal enables system-wide, central maintenance of users, including an optional connection to Windows Active Directories. The person-specific assignment of roles and authorizations minimizes maintenance effort while achieving a high degree of transparency. This provides a solid foundation for efficient and consistent administration of personalized access rights in the plant, which significantly reduces security risks.



Open communication

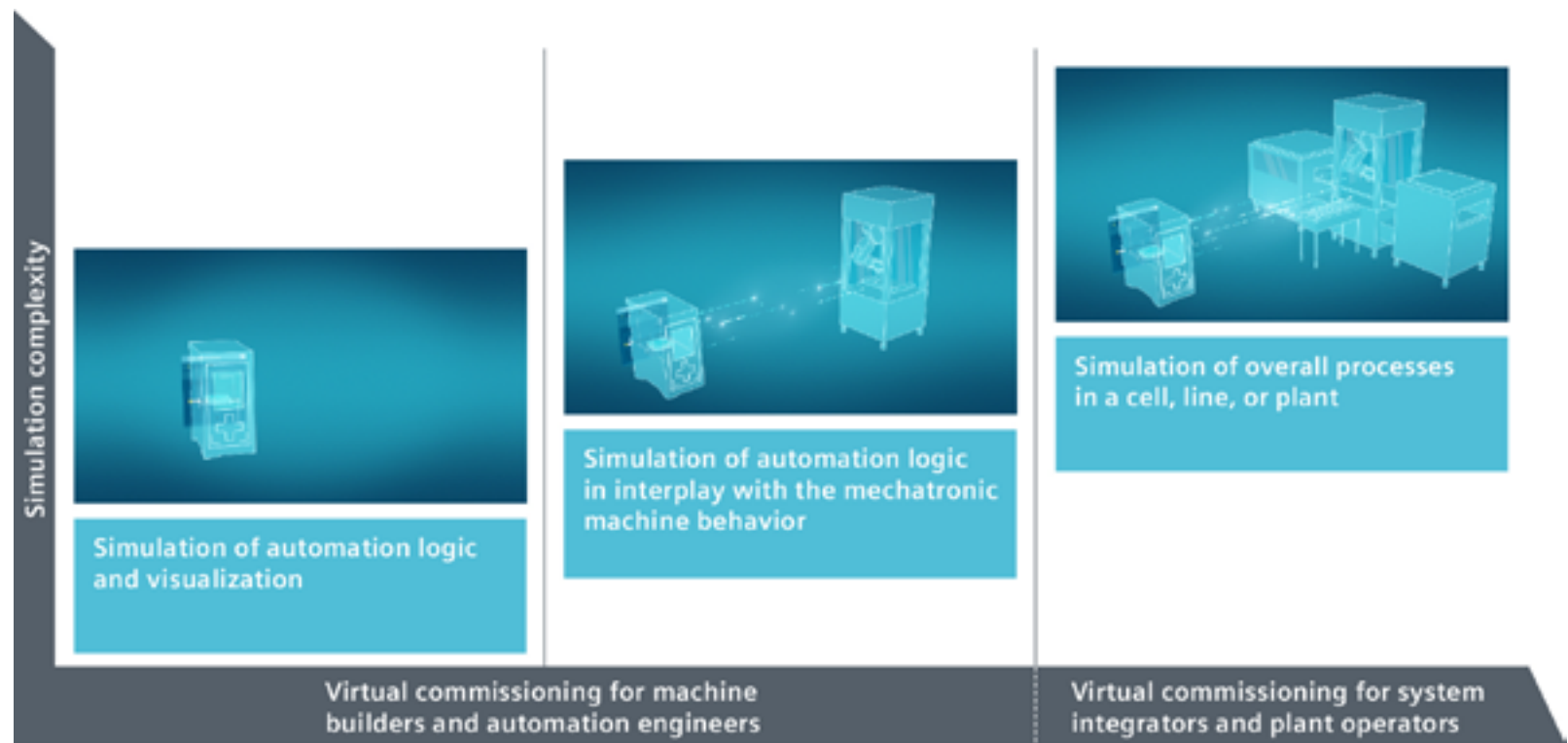
Connecting automation and IT level by means of open communication makes it easy to integrate higher-level MES/ERP solutions. The standardized OPC UA communication protocol lets you forward production data to systems of other manufacturers. Industrial Data-Bridge is used for bidirectional, cross-system communication via standard interfaces, without any programming work.

Simulate and optimize in a fully virtual environment

As a general rule, the later an error is found, the more expensive it becomes to correct. That's why it's particularly important for machine builders and plant operators to start searching for errors as early as possible in the development process. The goal is to ensure that the fewest possible errors arise during actual commissioning and that no defects occur.

The virtual commissioning of a machine using PLCSIM Advanced in TIA Portal offers an efficient alternative for reducing risk and effort during actual commissioning. It's even possible to use a virtual environment to simulate and optimize how the individual components of entire production lines work together.

www.siemens.com/virtual-commissioning ➔

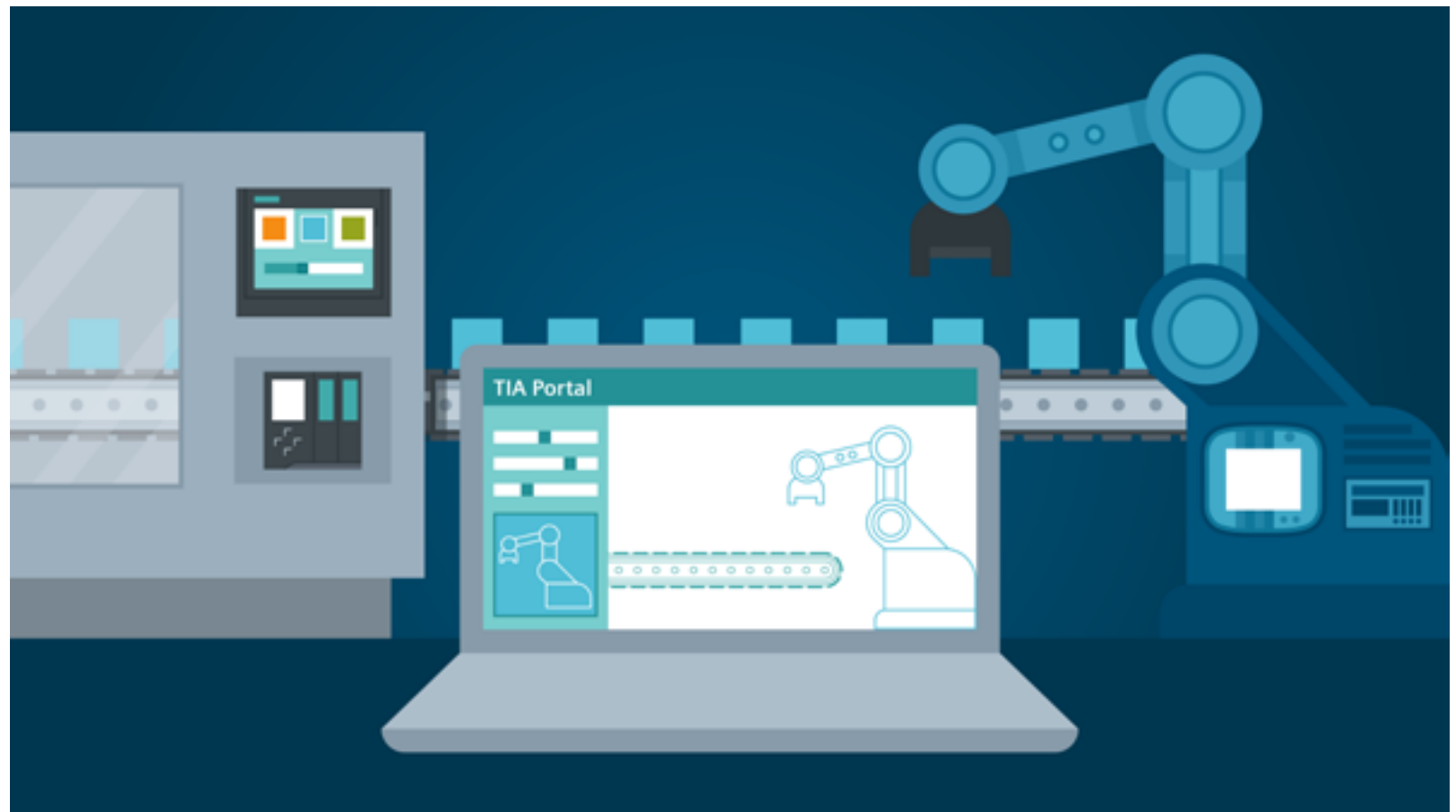


Robot integration in TIA Portal

Reducing time to market, increasing flexibility and efficiency: Digitalization offers both challenges and opportunities. Robot integration in TIA Portal makes it faster and easier to integrate robots while reducing engineering effort and operating complexity. This approach helps you efficiently bring together the PLC world and robots and allows you to take advantage of additional optimization potential while boosting both availability and productivity.

Integrating robots in your automation environment with the help of the TIA Portal is suitable for teaching applications such as palletizing or pick and place. Simulation applications such as welding, gluing, or sorting are also supported by linking PLM software such as Process Simulate to the TIA Portal.

www.siemens.com/tia-portal-robotics ➤



Standardization as the basis for digitalization

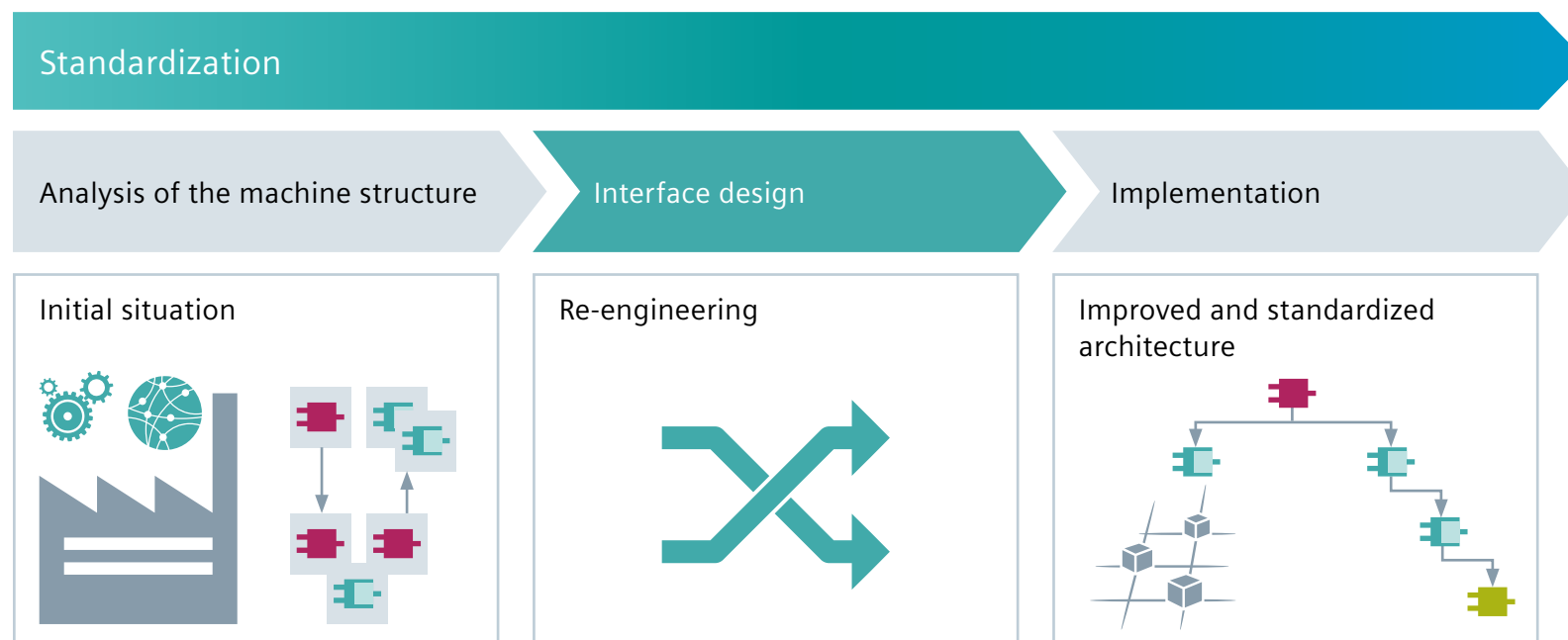
Standardization is required in order to parallelize work steps. But what are the expectations for this process? Standardization should increase flexibility and ensure reusability. This can be achieved with the help of libraries, uniform programming languages, and a uniform programming style guide.

For example, how can a machine be standardized? A module can be easily changed or swapped through suitable interconnection of function units.

The benefits of standardization:

- Software becomes more transparent for the user (service, maintenance) and thus easier to use
- Error sources are significantly reduced thanks to the use of already-proven program parts (modules)
- Expenses are minimized for IBN, service, and maintenance
- Diagnostics/troubleshooting are simplified
- Clear documentation of the module with defined behavior
- “Parallel engineering” of the same tasks is prevented
- Defined interfaces to other machines and plants (line integration)

[Topic page Standardization](#) ➤



Digitalization and the TIA Portal

TIA Portal options provide answers to customer requirements

TIA Portal options

SIMATIC S7-PLCSIM Advanced

Comprehensive simulation of the controller functionality including interaction with virtual plant and machine models



SIMATIC ODK 1500S

Supports the development of Windows and real-time functions and provides for the integration of high-level languages



SIMATIC OPC UA

Open communication standard for the communication concepts of Industrie 4.0



TIA Portal Cloud Connector

Boost the flexibility in your daily work through engineering in your private cloud



SIMATIC STEP 7 Safety

Provides for the seamless integration of machine safety into the SIMATIC automation system



SIMATIC Energy Suite/S7 Energy Efficiency Monitor

Energy transparency in production thanks to automatic creation and intuitive configuration



TIA Portal Teamcenter Gateway

Safeguarding projects plant-wide with the storage of TIA Portal projects in Teamcenter



SIMATIC Visualization Architect SiVArc

Implement standardized HMI visualizations with even greater efficiency through automatic generation



SIMATIC ProDiag

Diagnosis of application errors reduces production downtimes and increases the availability of your machines and plants



SIMATIC Target 1500S for SIMULINK

The software development can be integrated directly into the STEP 7 program through the automatic generation of executable code



SINAMICS Drive Control Chart (DCC)

Configuration and expansion of device functionality by means of freely available control, mathematical, and logic blocks



WinCC/WebUX¹

Diagnosis of application errors reduces production downtimes and increases the availability of your machines and plants



TIA Portal Multiuser Engineering

Work together on a project as a team and manage it flexibly on a server. Centrally track changes with user comments and versions in one location



TIA User Management Component

Reduction of security risks thanks to the efficient and consistent administration of personalized access rights in the plant



**Open, virtual, and networked
Digital workflow with TIA Portal**



**Shorten your time to market
Integrated engineering with TIA Portal**



**Increase your productivity
Transparent operation with TIA Portal**

¹Part of WinCC Runtime Professional

Easy access to the TIA Portal

Action packages



Trial user

TIA Portal V14 TRIAL download collections

www.siemens.com/tia-portal-trial ➤

Trial period: limited (21 days)

Upgraders

Software – STEP 7 V5.5 to SIMATIC STEP 7 Professional V15 Combo

Scope: Upgrade and power pack from STEP 7 V5.x to STEP 7 V15 Professional / Prof. 2017; SUS contract also required

Product no.: 6ES7822-1AE05-0XC2

SUS product no.: 6ES7810-5CC04-0YY2

Trial period: unlimited; prerequisites: STEP 7 V5.x license, STEP 7 V5.5 SUS

Important: The package is linked with a mandatory SUS contract.

First-time users

Starter kit with S7-1500 hardware

The starter kit includes everything you need to immediately put the high-performance SIMATIC S7-1500 into use.

www.siemens.com/s7-1500-starter-kits ➤

Starter kit with S7-1200 hardware

With the SIMATIC S7-1200 starter kits, you can quickly and easily implement your simple automation tasks.

www.siemens.com/s7-1200-starterkits ➤

Starter kit with Comfort Panel hardware

With high-resolution wide-screen displays ranging from 4" to 22" and the option of touch operation or operating buttons, the starter kits include everything you need to use the hardware.

www.siemens.com/comfort-panel-starter-kits ➤

Software – SIMATIC STEP 7 Professional V15 power pack: V15 Trial 365 → V15 (download)

After you purchase the SIMATIC S7-1500 starter kit, you can convert the included 365-day license to a full license of the same version with a power pack.

Product no.: 6ES7822-1BE05-0YC5

Prerequisites: S7-1500 starter kit

Temporary use

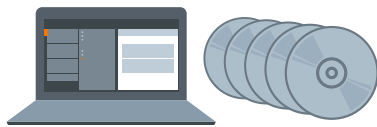
SIMATIC 50-h engineering license for infrequent use of the software (rental license)

Scope: STEP 7 Professional (TIA Portal & 2017), WinCC Professional (TIA Portal & WinCC flexible 2008), STEP 7 Safety Advanced (TIA Portal & Distributed Safety)

Product no.: 6ES7823-1GE05-0YA5

Trial period: 50 hours of actual use

Good to know



Software Update Service (SUS)

With the Software Update Service, you automatically receive all released versions of the software you use delivered right to your door – in other words, all upgrades and service packs.

www.siemens.com/SUS ➤

Online Software Delivery (OSD)

The clever alternative to traditional software delivery! Downloading automation software reduces your administrative expense and storage costs, and ensures simple, reliable, and always clearly organized license management.

www.siemens.com/OSD ➤

Your step into the future – migration made easy



Supporting documents and tools for migration

Migration to the TIA Portal is supported with several powerful tools and helpful documents, which you can simply download.

- TIA Portal readiness check tool: Check quickly and easily whether the hardware contained in your projects is supported by the TIA Portal.
Readiness-check ➤
- Compatibility tool: The tool allows you to assemble a compatible selection of software products or to check existing configurations for compatibility.
www.siemens.com/kompatool ➤

Individual modernization support

On request, Siemens can provide you with personal support for very specific requirements:

www.siemens.com/industry/contact ➤

www.siemens.com/fa-services ➤

From consultation and implementation to final project completion, Siemens offers comprehensive modernization services:

www.siemens.com/fa-migration ➤

Details are available at:

www.siemens.com/tia-migration ➤

Documentation

Migration guides:

From SIMATIC S7-300/400 to S7-1500

www.siemens.com/s7-300/400-s7-1500 ➤

From SIMATIC S5 to S7-1500

www.siemens.com/s5-s7-1500 ➤

From SIMATIC WinAX RTX to
S7-1500 Software Controller

www.siemens.com/winax-rtx-s7-1500 ➤

On the path to the digital enterprise – discover your potential with training courses for SIMATIC S7-1500 training in the TIA Portal



Industry is undergoing rapid developments that are being further accelerated by digitalization. The technologies today are so complex that continuous education and regular courses on training equipment are essential in order to keep skills up to date.

We offer you product training tailored to match all topic areas so that you can get the most from the capabilities of the extensive SIMATIC range of products. The training covers the entire life cycle of your plant. SIMATIC S7 service and programming training form the core of product training. The course content covers not only the main topics of SIMATIC S7-1500 in the TIA Portal but also includes programming languages, operator control and monitoring systems, drive technology, industrial communication and safety technology.

www.siemens.com/sitrain-tiaportal ➤



Siemens automation tasks

Efficient automation begins with efficient engineering. Consistent, end-to-end engineering enables savings with regard to time, costs, and effort. Based on specific tasks, our web tutorials show you how you can reduce your project planning time in your daily work. We ensure that step by step, you will arrive at a result in less than 10 minutes. We offer you a total of nine topics with more than 50 web tutorials. These include:

- TIA digitalization use cases [➤](#)
- Automatic generation of HMI visualizations with SiVArc
- Efficient teamwork with TIA Portal Multiuser
- Open communication standard OPC UA with SIMATIC S7

www.siemens.com/automation-tasks [➤](#)



TIA Portal Tutorial Center

The TIA Portal Tutorial Center gives you an overview of the functions and tools in the TIA Portal as well as how the configuration and programming tools work smoothly together. The tutorials are aimed at planners and project engineers as well as commissioning and service personnel. The videos cover technical content and provide assistance for all stages of the machine and plant lifecycle. These include:

- Explanations regarding the SIMATIC S7 architecture
- Introduction to the programming languages
- Introduction to standardization with the TIA Portal libraries



www.siemens.com/tia-portal-tutorial-center [➤](#)



TIA Portal – Online Support – An overview of the most important documents and links

This page gives you an overview of the most important documents and links to TIA Portal. Both beginners and experienced TIA Portal users will find the most important TIA Portal information here.

www.siemens.com/tia-portal-online-support [➤](#)

Software packages and options

	SIMATIC STEP 7/ STEP 7 Safety	SIMATIC WinCC	SINAMICS Startdrive	SIMOTION SCOUT TIA	Soft Starter ES/ SIMOCODE ES
Scope of services	Software Controller – SIMATIC S7-1500 (F/T/TF) Advanced Controller – SIMATIC S7-1500 and SIMATIC S7-300/400 (F/T/TF) Distributed Controller – SIMATIC ET 200 CPUs (F/T/TF) Basic Controller – SIMATIC S7-1200 (F) Basic Basic Professional Advanced	SCADA Single PC workstation Comfort Panels and Mobile Panels Basic Panels Basic Comfort Advanced Professional	Convenient, guided acceptance of the Safety Integrated functions Commissioning, optimization, and diagnostics for continuous and cyclic applications: S210, S120, G120, G130, G150, S150 V90 PROFINET STEP 7 integrated Basic (free) Advanced Professional	SIMOTION D SIMOTION P SIMOTION C Professional	Additional access via PROFIBUS/PROFINET Additional graphic parameterization and extended diagnostics Additional online functions via SIRIUS PtP List parametrization via PN/PB; parametrization during start-up STEP 7 integrated Basic (free) Standard Premium

SIMATIC STEP 7/ STEP 7 Safety	SIMATIC WinCC	SINAMICS Startdrive	SIMOTION SCOUT TIA	Soft Starter ES/ SIMOCODE ES
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Engineering options

TIA Portal Multiuser Engineering				
TIA Portal Teamcenter Gateway				
TIA Portal Cloud Connector				
SIMATIC Energy Suite ES				
SIMATIC S7-PLCSIM Advanced				
SIMATIC STEP 7 Safety				
SIMATIC ODK 1500S				
SIMATIC Target 1500S for SIMULINK				
	SIMATIC Visualization Architect	SINAMICS Drive Control Chart (DCC)		

Runtime options

SIMATIC ProDiag				
SIMATIC Energy Suite RT				
SIMATIC OPC UA	WinCC/WebUX			
TIA User Management Component				

References

Transparency in the colorful world of spices:

Customer: Juan José Albarracín S.A.,
Murcia, Spain

Juan José Albarracín was founded in 1854 and is the oldest company in the production and marketing of high-quality spices, paprika, and pepper mixtures in all variations. The company enjoys a leading position in the market thanks to its exceptional quality and outstanding service. TIA Portal makes it possible to quickly and easily combine all components in a single solution. Juan José Albarracín was even able to implement this system and increase productivity without interrupting operations. Better control of the production lines enables the company to set the ideal grinding parameters to ensure perfect product quality. Problems can be identified earlier, often even before they occur, and production data can easily be integrated into the higher-level planning system.

[Learn more](#) ➤

“Thanks to TIA Portal, we can easily create and implement the complete automation – you don’t have to be a programmer to do it. WinCC and TIA Portal also made it very easy for us to create the visualization.”

Diego Saura, project manager



The world's largest automated seamless pipe-making plant counts on the Siemens portfolio

The Tenaris Bay City seamless pipe mill covers 1.2 million square meters. It is the world's largest automation implementation using the Siemens TIA Portal to program and manage nearly 50,000 IO points across 4,000 network nodes. The challenge was to build the world's safest and most efficient seamless pipe mill to provide customers with better service.

With the help of advanced automation, network, drive, and power technology as well as expertise from Siemens, Tenaris was able to create a digital showcase for integrated automation, drive systems, and power that ensures efficiency and safety, along with a flagship operating model for the global production network.

The goal was to put the plant in Bay City into operation on time without sacrificing safety or quality. To streamline this final phase, the plan was to use software to perform test simulations of almost everything in a virtual environment before moving to the real version – virtual commissioning.

“With the Siemens gear and using the TIA Portal code, we were able to build a 3D model of the plant and test all the Siemens controllers, drives, networks, IO, and other components in simulation before installation. We were able to make hundreds of adjustments, which translated into significant time savings in the commissioning phase, allowing us to open the plant on time.”

Pablo Fushimi, Tenaris Project Senior Director





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development of the products. The requested performance
features are binding only when they are expressly agreed
upon in the concluded contract.