

A photograph of a Siemens SIMATIC controller rack. The rack is filled with various modules, including a CPU, a power supply, and several I/O modules. The rack is labeled with 'S7-1500' and 'S7-1200'. The Siemens logo and slogan 'Ingenuity for life' are visible in the top right corner. The background shows a factory floor with a metal structure.

**SIEMENS**

*Ingenuity for life*

PC-System  
IPC427D PN/IE

CPU  
1507SF

S7-1500

Engineered with TIA Portal

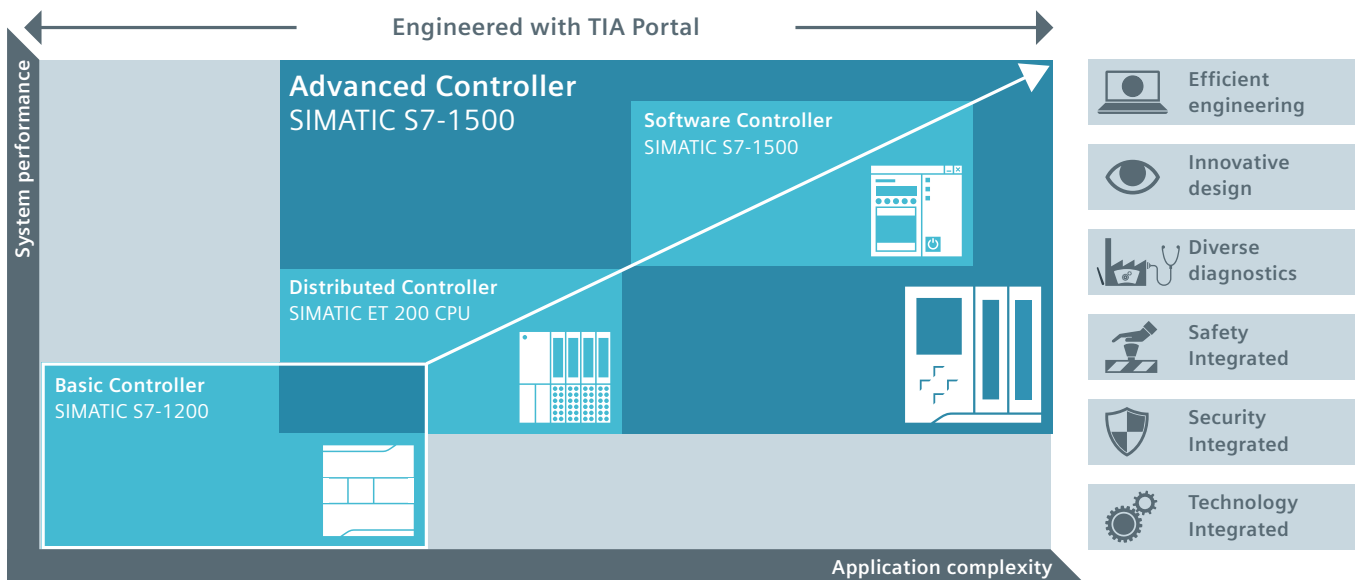
The intelligent choice  
for your automation  
tasks

SIMATIC Controllers

[usa.siemens.com/controllers](http://usa.siemens.com/controllers)

# Overview of the SIMATIC controller portfolio

Siemens offers the right controller for a wide range of automation requirements. The SIMATIC range of controllers comprises Basic, Advanced, Distributed and Software Controllers offering impressive scalability and integration of their functions. The engineering in the Totally Integrated Automation Portal (TIA Portal) enables optimum automation solutions to be found for every application.



## Basic Controller

Basic Controllers are the intelligent choice for compact automation solutions with integrated communication and technology functions. They are available in both standard and safety versions.

## Distributed Controller

Distributed Controllers are used for machines with a distributed architecture and for series machines with limited space available. They combine the advantages of a SIMATIC S7-1500 with the design of a SIMATIC ET 200SP.

## Advanced Controller

Advanced Controllers automate not only complete production plants, but also applications which demand the greatest performance, flexibility and networking capability. Sophisticated motion control tasks are implemented with the technology CPU.

## Software Controller

The Software Controllers are used wherever maximum precision and speed are required as well as PC-based automation. The PC-based controllers operate independently of the operating system. Like all SIMATIC controllers, the Software Controller is also available with Safety Integrated.

# The intelligent choice for every requirement

Every machine or plant is different in terms of system performance needs and complexity. Requirements regarding technology and safety systems may be applied. With its comprehensive range of SIMATIC controllers, Siemens offers the perfect control solution for every application. The overview below simplifies the intelligent choice for every requirement!

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## Application

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## CPU types

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### Engineering efficiency

Programming software

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Programming languages

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### Innovative design

Portfolio

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Design of the IO modules

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Wiring

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Mounting

---

PROFINET interfaces/ports (max.)

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### High performance

Performance characteristics

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Communication options\*

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Isochronous mode (IRT)

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### Reliable diagnostics

Integrated system diagnostics

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User-defined messages

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Display of the diagnostic message

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### Safety Integrated

Fail-safe

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### Technology Integrated

Motion Control

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Counting and measuring

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PID controller

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### Security Integrated

Know-how-protection

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Copy protection

\* onboard or with add-on module



**Basic Controllers –  
Be flexible thanks to networking possibilities**

- Compact controllers with integrated IOs, technology and communication functions
- Networking options via various communication standards by means of integrated functions (PROFINET, Modbus, etc.) or add-on modules (IO-Link, AS-i, etc.)
- Flexible in design and with modular expansion options



**Advanced Controllers –  
Increase productivity with the ultimate power**

- Controllers with extensive system functions and high performance
- Unique power thanks to high-performance backplane bus, extremely short terminal-to-terminal response times and high-speed signal processing
- Ensures maximum performance and user-friendliness

Compact automation solution with requirements for integrated communication and technology functions – often combined with cost effectiveness	Complete production automation and applications for medium- sized and high-end machines with high demands in terms of performance, communication, flexibility and technology functions
CPU 1211C, 1212C (F), 1214C (F), 1215C (F), 1217C	CPU 1511C, 1512C, 1511 (F), 1513 (F), 1515 (F), 1516 (F), 1517 (F), 1518 (F), 1518 ODK (F), 1511T, 1515T, 1517T (F)
STEP 7 Basic or Professional in the TIA Portal, STEP 7 Safety Basic	STEP 7 Professional in the TIA Portal, STEP 7 Safety Advanced
(F-)LAD, (F-)FBD, SCL	(F-)LAD, (F-)FBD, STL, SCL, GRAPH, C++ (1518 ODK)
Compact-CPU	Compact and modular CPUs
Expandable centrally	Expandable centrally and on distributed basis
Screw	Push-in and screw terminals
IP20 DIN rail	IP20 mounting bar
1/2 (RJ45)	3/4 (RJ45)
Small to medium	Large
PROFINET, PROFIBUS, PtP, AS-Interface, IO-Link, CANopen, Modbus RTU and TCP, Telecontrol	PROFINET (including PROFI-safe, PROFI-energy and PROFI-drive), PROFIBUS, PtP, Modbus RTU and TCP
No	Yes, decentralized
Diagnostic functions	Diagnostic functions, process and system diagnosis (e.g. information in diagnostic buffer)
User diagnostics messages	User diagnostics messages, message status, program message with associated values
Engineering, HMI, web server	Display, engineering, HMI, web server
Yes	Yes
Control speed, positioning	Control speed, positioning, output cam, measuring input, gearing (relative), T-CPU with gearing (absolute) and camming
Integrated in CPU	Integrated into S7-1500 compact CPU or with technology modules
Yes	Yes
Yes	Yes
Yes	Yes



**Distributed Controllers –  
Save space with the smallest footprint**

- Controllers with distributed design
- ET 200SP controller: combines the advantages of the S7-1500 and the very compact design of the ET 200SP with a high channel density
- Space savings in the control cabinet and financial savings due to the use of distributed intelligence
- ET 200pro controller with IP65/67 protection for use outside the control cabinet



**Software Controllers –  
Be open and independent**

- C-based controller independent of the operating system
- Complete engineering in the TIA Portal: no Windows settings necessary
- Easy implementation of interfaces to PC applications, and integration of high-level language code with real-time capability
- Comprehensive hardware platforms with SIMATIC IPCs

Machines with distributed architecture, series machines, with limited space requirements for the mid-performance range	Machines in the high-performance range which require maximum precision and speed, as well as a PC connection
CPU 1510SP-1PN (F), 1512SP-1PN (F), 1515SP PC (F), 1516pro-2PN (F)	CPU 1507S (F)
STEP 7 Professional in the TIA Portal, STEP 7 Safety Advanced	STEP 7 Professional in the TIA Portal, STEP 7 Safety Advanced
(F-)LAD, (F-)FBD, STL, SCL, GRAPH, High-level languages (C++/Windows-applications)	(F-)LAD, (F-)FBD, STL, SCL, GRAPH, High-level languages (C++/Windows-applications)
Modular CPUs	Software-based CPU
Expandable centrally and on distributed basis	Hardware dependent
Push-in	Distributed I/O system
IP20 DIN rail and IP67	Hardware dependent
2/3 (RJ45, FC, FOC), flexible bus adapter	Hardware dependent
Average	Large
PROFINET (including PROFI-safe, PROFInergy and PROFIdrive), PROFIBUS, PtP, Modbus RTU and TCP, AS-Interface, IO-Link	Hardware dependent
Yes, decentralized	No
Diagnostic functions, process and system diagnosis (e.g. information in diagnostic buffer)	Diagnostic functions, process and system diagnosis (e.g. information in diagnostic buffer)
User diagnostics messages, message status, program message with associated values	User diagnostics messages, message status, program message with associated values
Engineering, HMI, web server	Engineering, HMI, web server
Yes	Yes
Control speed, positioning, output cam, measuring input, gearing (relative)	Control speed, positioning, output cam, measuring input, gearing (relative)
With technology modules	With technology modules
Yes	Yes
Yes	Yes
Yes	Yes

# Why choose Siemens as your Automation Partner?

## ROI

We can help you increase your ROI by investing in our “best-in-class” solutions that are early in their product lifecycles, resulting in solutions for future technologies – today. An example is our TIA Portal – a single engineering framework that seamlessly integrates controllers, distributed I/O, HMI, drives, motion control and motor management – allowing you to reduce your engineering time by up to 30%.

## Productivity

Siemens helps customers increase productivity and reduce scrap rates through our integrated “no programming” diagnostic capabilities that allow you to display to your line operator exactly what has happened to your system.

## Transparency

Efficient sharing and receiving of data allows for easy access for quicker, smarter decisions. Our devices have the ability to connect to existing third-party controllers for data sharing and move information to today’s MRP systems. Remote monitoring is easily achieved with the included web servers built into the devices.

## Leading Technology

Our state-of-the-art products allow you to enhance your flexibility and throughput for increased competitiveness. For example, our new SIMATIC S7-1500 controller family is a comprehensive portfolio offering extremely fast response times, safety integration, security integration, easy commissioning and integrated system diagnostics for the full range of medium and high-end applications.

## Safety

With Safety Integrated, we offer the world’s most unique and comprehensive portfolio of control, drive and switching technology, which covers all requirements placed upon the functional safety of machines and systems. From risk assessment, to safety validation, Siemens supports you throughout the complete machine safety lifecycle. Siemens Safety Integrated provides you with reliable protection of persons, machines and the environment. It exceeds global compliance requirements and provides the most sustainable efficiency, flexibility and safety.

## Security

Siemens provides a comprehensive, integrated approach for the protection of plant, network and system security. This includes designing security features directly into our automation components as well as customizable security services.

## Support

We provide global and local sales and support to ensure you get the help when and where you need it. Siemens is active in 190 countries and has an extensive channel and solution partner network.

### Why not just stay with your current vendor?

Staying with your current vendor might not be as easy as you may think. Even if you replace your obsolete products with their “newer” versions, you may still need to convert your code to their new programming software, train your engineers and maintenance personnel, and risk downtime during the changeover. Siemens makes this process easy with our modernization tools, step approach, training and support – with the added bonus of upgrading your system to state-of-the-art technologies that are fresh in their product lifecycles and can sustain you into the future.

# Integrated functions in all SIMATIC controllers

Apart from scalability, every controller offers integrated system functions such as efficient engineering, high performance, innovative design, reliable diagnostics, Safety Integrated, Technology Integrated and Security Integrated. This allows flexibility in the design or adaption of automation solutions, without repeatedly having to accumulate further know-how and expertise.



## Efficient engineering

The seamless integration of SIMATIC controllers in the common TIA Portal engineering framework permits the consistent storage of data, the smart library concept, and a uniform operating philosophy. This makes the use of universal functions particularly easy.

## Reliable diagnostics

The integrated system diagnostics with efficient fault analysis and fast troubleshooting cuts commissioning times and minimizes downtimes in production. Faults are uniformly indicated in the engineering on the HMI, in the web server and in the display of the SIMATIC S7-1500.

## Innovative design

Each controller can be set up and wired differently. The SIMATIC controller portfolio offers modular, compact and PC-based CPUs.

## Safety Integrated

Fail-safe SIMATIC controllers offer the greatest possible level of integration: one controller, one communication system and one engineering for both standard and failsafe automation.

## Technology Integrated

Technology functions for counting and measuring tasks, closed-loop control and motion control are integrated into all SIMATIC controllers. Technology CPUs are used for sophisticated motion control tasks.

## Security Integrated

Intellectual property and the investment it represents are safeguarded by the integration of know-how protection, protection against copying and manipulation, and additional password protection for access to program contents.

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Siemens offers automation and drives products  
with industrial security functions that support safe  
operation of the plant or machine. They are an  
important component in a holistic industrial security  
concept. With this in mind, our products undergo  
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that you keep yourself informed with respect to our  
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You can find information on this at:  
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There you can also register for a newsletter  
specifically about these products.

To ensure the secure operation of a plant or  
machine, it is also necessary to take suitable  
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to integrate the automation and drive components  
into a state-of-the-art, holistic industrial security  
policy for the entire plant or machine. Products used  
from other manufacturers should also be taken into  
account here.

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