SIEMENS

Product portfolio overview

SIMATIC S7-1500 plus TIA Portal

Power + Efficiency

The Ultimate Plus in Automation

Intuitive, efficient, proven –
The TIA Portal redefines engineering

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SIMATIC S7-1500 – Highest efficiency and maximum usability for complex automation tasks
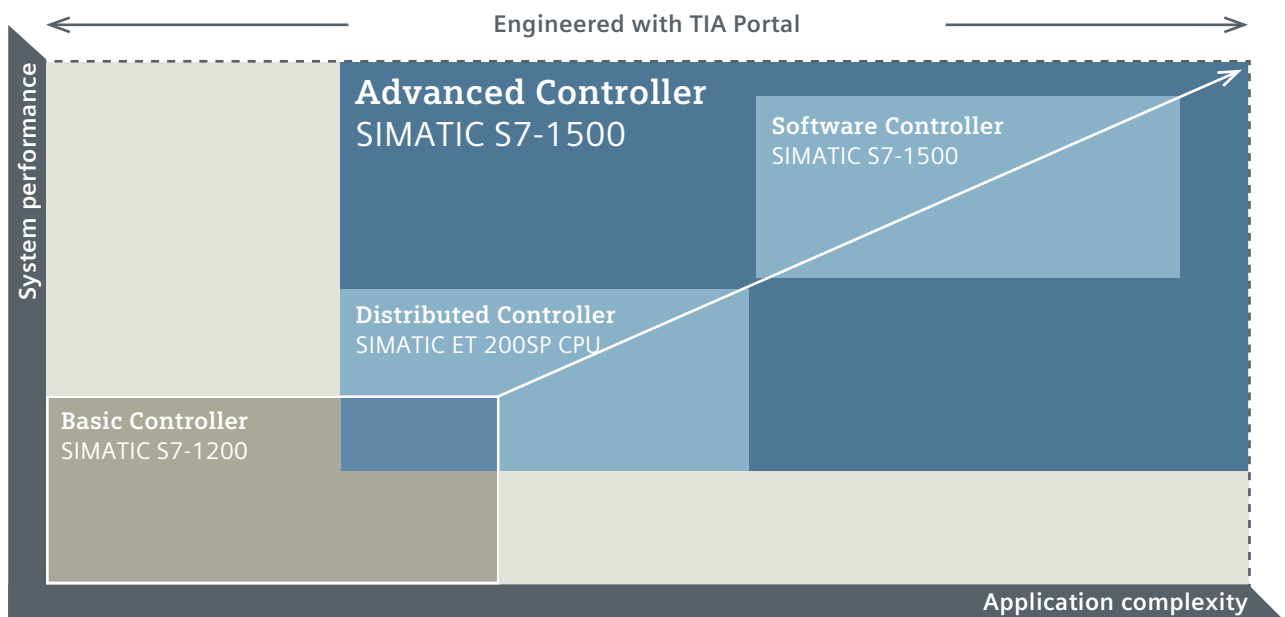
SIMATIC S7-1500 plus TIA Portal

The SIMATIC® S7-1500 controller set new standards in system performance and usability. This also applies to the two youngest members of the controller family, CPU 1511C and CPU 1512C. These especially compact advanced controllers deliver a powerful performance despite their slim dimensions while also featuring integrated technology functions – thus rounding out the S7-1500 portfolio. At the same time, the Totally Integrated Automation Portal (TIA Portal) redefines the topic of efficiency in engineering, configuring and operation. As a team, SIMATIC S7-1500 and TIA Portal are unbeatable. Together, they ensure enhanced plant availability as well as setting standards for the future.

Seamless integration of the SIMATIC S7-1500 controller into the TIA Portal makes it possible to access a common database, and provides a uniform operating concept and shared centralized services, making it especially easy to use system-wide functions. The controller is quick and easy to install and connect, and with its short system response times, it boosts productivity in the twinkling of an eye. For you, this means more flexibility in handling, shorter time-to-market, and a fast rate of return on your plant.

Scalable performance and functionality for every application

In terms of performance and functionality, the SIMATIC S7-1500 Controller supports scalable and therefore cost-efficient automation solutions in every case. It builds on the functionality of the less sophisticated SIMATIC S7-1200 controller, meaning you benefit from consistent processes and maximum efficiency in engineering, operation, and maintenance, and when migrating systems.

Engineered with TIA Portal

System performance

Advanced Controller
SIMATIC S7-1500

Software Controller
SIMATIC S7-1500

Distributed Controller
SIMATIC ET 200SP CPU

Basic Controller
SIMATIC S7-1200

Application complexity

Siemens offers the right controller for an extremely wide range of automation requirements. The new generation of SIMATIC Controller, comprising Basic, Advanced, Distributed and Software Controllers, leaves a lasting impression with its scalability and continuous functionality.

Totally Integrated Automation Portal – the common engineering framework

Software packages

SIMATIC STEP 7 PROFESSIONAL V13 SP1	DVD	6ES7822-1AA03-0YA5
SIMATIC STEP 7 PROFESSIONAL V13 SP1	Download	6ES7822-1AE03-0YA5
SIMATIC WinCC COMFORT V13 SP1	DVD	6AV2101-0AA03-0AA5
SIMATIC WinCC COMFORT V13 SP1	Download	6AV2101-0AA03-0AH5
SIMATIC STEP 7 SAFETY ADVANCED V13 SP1	DVD	6ES7833-1FA13-0YA5
SIMATIC STEP 7 SAFETY ADVANCED V13 SP1	Download	6ES7833-1FA13-0YH5
SINAMICS STARTDRIVE V13 SP1		6SL3072-4DA02-0XG0

Starter Kit

Starter Kit

SIMATIC S7-1500 Starter Kit Contains: STEP 7 Professional V13 SP1, 365-day license, SIMATIC S7-1500 CPU 1511-1 PN, SIMATIC Memory Card 4 MB, digital input module DI 16x 24 V DC, digital output module DO 16x 24 V DC/0.5 A ST Mounting rail 160 mm, front connector, power module PM 70 W 120/230 V AC SIMATIC TOP connect: front connector module, push-in SIMATIC TOP connect: connecting cable SIMATIC TOP connect: 3-wire connection module Standard Ethernet CAT 5 cable, screwdriver	6ES7511-1AK01-4YB5

1 Central systems

CPUs

Standard CPUs

CPU 1511-1 PN	6ES7511-1AK00-0AB0
CPU 1513-1 PN	6ES7513-1AL00-0AB0
CPU 1515-2 PN	6ES7515-2AM00-0AB0
CPU 1516-3 PN/DP	6ES7516-3AN00-0AB0
CPU 1517-3 PN/DP	6ES7517-3AP00-0AB0
CPU 1518-4 PN/DP	6ES7518-4AP00-0AB0

Compact CPUs

CPU 1511C-1 PN	6ES7511-1CK00-0AB0
CPU 1512C-1 PN	6ES7512-1CK00-0AB0

Fail-safe CPUs

CPU 1511F-1 PN	6ES7511-1FK00-0AB0
CPU 1513F-1 PN	6ES7513-1FL00-0AB0
CPU 1515F-2 PN	6ES7515-2FM00-0AB0
CPU 1516F-3 PN/DP	6ES7516-3FN00-0AB0
CPU 1517F-3 PN/DP	6ES7517-3FP00-0AB0
CPU 1518F-4 PN/DP	6ES7518-4FP00-0AB0

Interface modules

ET 200MP

PROFINET

IM 155-5 PN ST	6ES7155-5AA00-0AB0
IM 155-5 PN HF	6ES7155-5AA00-0AC0

PROFIBUS

IM 155-5 DP ST (incl. PROFIBUS connector)	6ES7155-5BA00-0AB0

2

IO modules

IO modules	
35-mm wide modules (without front connector)	
DI 16x 24 V DC HF	6ES7521-1BH00-0AB0
DI 32x 24 V DC HF	6ES7521-1BL00-0AB0
DI 16x 24 V DC SRC BA	6ES7521-1BH50-0AA0
DI 16x 230 V AC BA	6ES7521-1FH00-0AA0
DO 16x 24 V DC/0.5 A ST	6ES7522-1BH00-0AB0
DO 32x 24 V DC/0.5 A ST	6ES7522-1BL00-0AB0
DO 8x 24 V DC/2 A HF	6ES7522-1BF00-0AB0
DO 8x 230 V AC/2 A ST	6ES7522-5FF00-0AB0
DO 8x 230 V AC/5 A ST	6ES7522-5HF00-0AB0
DO 16x 230 V AC/1 A ST (Triac)	6ES7522-5FH00-0AB0
DO 16x 230 V AC/2 A ST (Relay)	6ES7522-5HH00-0AB0
AI 8x U/I/RTD/TC ST *	6ES7531-7KF00-0AB0
AI 8x U/I HS	6ES7531-7NF10-0AB0
AO 4x U/I ST	6ES7532-5HD00-0AB0
AO 8x U/I HS	6ES7532-5HF00-0AB0
F-DI 16x 24 V DC PROFIsafe	6ES7526-1BH00-0AB0
F-DQ 8x 24 V DC / 2 A PPM PROFIsafe	6ES7526-2BF00-0AB0
25-mm wide modules (incl. front connector)	
DI 16x 24 V DC BA	6ES7521-1BH10-0AA0
DI 32x 24 V DC BA	6ES7521-1BL10-0AA0
DO 16x 24 V DC/0.5 A ST	6ES7522-1BH10-0AA0
DO 32x 24 V DC/0.5 A ST	6ES7522-1BL10-0AA0
DI 16x 24 V DC/DO 16x 24 V DC/0.5 A BA	6ES7523-1BL00-0AA0
AI 4x U/I/RTD/TC ST *	6ES7531-7QD00-0AB0
AO 2x U/I ST	6ES7532-5NB00-0AB0
AI/AO 4x U/I/RTD/TC / 2x U/I ST *	6ES7534-7QE00-0AB0

* Half of channels for RTD

Communication

PtP		
CM PtP, RS232 BA		6ES7540-1AD00-0AA0
CM PtP, RS232 HF		6ES7541-1AD00-0AB0
CM PtP, RS422/485 BA		6ES7540-1AB00-0AA0
CM PtP, RS422/485 HF		6ES7541-1AB00-0AB0
Communication modules for point-to-point or multipoint communication with the protocols Freeport, 3964(R), Modbus RTU or USS. Transfer rates up to 115.2 kbit/s are supported.		
PROFIBUS		
CM 1542-5 PROFIBUS communication module		6GK7542-5DX00-0XE0
CP 1542-5 PROFIBUS communications processor		6GK7542-5FX00-0XE0
Communication modules for PROFIBUS with DP master or DP slave function (CP/CM) and larger quantity structure, as well as dataset routing (CM).		
Ethernet		
CP 1543-1, Ethernet security		6GK7543-1AX00-0XE0
CM 1542-1, PROFINET communications processor		6GK7542-1AX00-0XE0
Communication modules for Industrial Ethernet with Security Integrated by means of VPN and firewall (CP), or for additional PROFINET interfaces (CM).		

3

Technology modules

Technology modules		
TMs		
TM Count 2x24V		6ES7550-1AA00-0AB0
TM PosInput 2		6ES7551-1AB00-0AB0
TM Timer DIDQ 16x24V		6ES7552-1AA00-0AB0
Modules for counter functions up to 200 kHz or 1 MHz, with measuring functions for frequency, period duration or speed, for position detection with incremental or absolute encoders as well as for implementing cam controllers and especially precise response times.		

4

Power supply and system wiring

PM load current supply

| PM 70 W, 120/230 V AC | | 6EP1332-4BA00 |
| PM 190 W, 120/230 V AC | | 6EP1333-4BA00 |

The load current supply (PM) provides 24 V power for SIMATIC S7-1500 modules such as CPU,
system power supplies, IO circuits of the peripheral modules and, where required, sensors and actuators.

PS system power supply

System power supply 25 W, 24 V DC		6ES7505-0KA00-0AB0
System power supply 60 W, 24/48/60 V DC		6ES7505-0RA00-0AB0
System power supply 60 W, 120/230 V AC/DC		6ES7507-0RA00-0AB0

The system power supply (PS) provides the power for the S7-1500 modules via the backplane bus.

SIMATIC TOP connect system wiring

Fully modular connection: front connector module for IO modules, connecting cables and terminal modules for connecting field sensors/actuators.
Flexible connection: front connector with single wires, for connecting sensors/actuators in the control cabinet.
You will find more information about SIMATIC TOP connect in the Siemens Industry Mall or at
http://www.siemens.com/simatic-tc

SIPLUS extreme

Individually customized products, systems and solutions for all aspects of automation and drives engineering, for dependable operation even under difficult to extreme rated conditions. You can find information on SIPLUS extreme in the Siemens Industry Mall or at http://www.siemens.com/siplus-extreme

Accessories and spare parts

Accessories

Mounting rail, 160 mm (with drill hole)		6ES7590-1AB60-0AA0
Mounting rail, 245 mm (with drill hole)		6ES7590-1AC40-0AA0
Mounting rail, 482 mm (with drill hole)		6ES7590-1AE80-0AA0
Mounting rail, 530 mm (with drill hole)		6ES7590-1AF30-0AA0
Mounting rail, 830 mm (with drill hole)		6ES7590-1AJ30-0AA0
Mounting rail, 2000 mm (without drill hole) for self-customizing		6ES7590-1BC00-0AA0
PE connection element for mounting rail 2000 mm (spare part), 20 pcs.		6ES7590-5AA00-0AA0
Front connector for 35-mm wide modules; screw terminal, 40-pin		6ES7592-1AM00-0XB0
Front connector for 35-mm wide modules; push-in terminal, 40-pin		6ES7592-1BM00-0XB0
SIMATIC Memory Card 4 MB		6ES7954-8LC02-0AA0
SIMATIC Memory Card 12 MB		6ES7954-8LE02-0AA0
SIMATIC Memory Card 24 MB		6ES7954-8LF02-0AA0
SIMATIC Memory Card 256 MB		6ES7954-8LL02-0AA0
SIMATIC Memory Card 2 GB		6ES7954-8LP01-0AA0
SIMATIC Memory Card 32 GB		6ES7954-8LT02-0AA0
Front cover for DP interface of the CPU 1518-4 PN/DP, 1 unit		6ES7591-8AA00-0AA0

Spare parts

| Display for CPU 1511(F), CPU 1511C, CPU 1512C and CPU 1513(F) | | 6ES7591-1AA00-0AA0 |
| Display for CPU 1515(F), CPU 1516(F), CPU 1517(F) and CPU 1518(F) | | 6ES7591-1BA00-0AA0 |

> *"Dieffenbacher provides automation from the individual machine right up to entire plants. Therefore the free scalability of the SIMATIC S7-1500 is the perfect basis for us."*
>
> Ulf Könekamp (German company Dieffenbacher)

Your plus of power and efficiency

Enhanced usability through innovative design and handling

- Commissioning and diagnostics are simplified by built-in CPU display showing system diagnostics messages in plaintext, as well as changes of IP addresses, for example.

- A standardized front connector and convenient wiring solutions enable simple installation and reduced parts logistics.

Increased productivity through lower cycle times and top-speed troubleshooting

- High-speed backplane bus, terminal-terminal response times of less than 100 µs, and command processing of up to 1 ns result in extremely short execution times.

- With integral system diagnostics, a trace function, and a standardized display concept in the TIA Portal, the HMI, the Webserver and the display of the S7-1500, faults can be located and corrected efficiently.

Protection for intellectual property and the machine through Security Integrated

- Your intellectual property and the investment it represents are perfectly protected thanks to integrated know-how, copy and tampering protection as well as additional password protection for access to program contents and secure communication.

- Extended access protection thanks to integrated firewall via Security CP 1543-1.

Simple creation and implementation of motion and closed-loop control applications

- Integrated motion control functions for flexible connection of drives via PROFINET, PROFIBUS or analog interfaces, as well as programming of motion sequences with PLCopen motion blocks.

- Configuration of continuous and discrete pulse width modulation thanks to integrated PID control.

Easy CPU selection due to one automation system for standard and fail-safe

- Safety Integrated applies to all S7-1500 Standard CPUs and enables simple connection of PROFIsafe device via PROFIBUS and PROFINET. It was designed for us in safety-related applications to SIL 3 according to IEC 62061, and PL e according to ISO 13849

Efficient engineering thanks to comprehensive software and hardware functions

- The innovative engineering framework TIA Portal integrates HMI, controllers, distributed IO, motion control and drives seamlessly into one engineering environment.

- Integration of the SIMATIC S7-1500 controllers in the TIA Portal provides complete symbolic programming, an optimized compiler for enhanced performance, and the same range of commands for all programming languages.

Discover more:

www.siemens.com/s7-1500

Experience everything about SIMATIC S7-1500:

> In video form: Design over-view and videos showing the main highlights

> As a 360° animation: Experience all the benefits directly on the product

> All about the outstanding engineering efficiency thanks to TIA Portal

> The latest references and podcasts

SIMATIC
S7-1500 –
take a look!

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 continuous development. We therefore recommend that you keep yourself informed with respect to our product updates, and that you only use the latest versions in each case.

You can find information on this at:
http://support.automation.siemens.com.

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 preventive action (e.g. cell protection concept) and 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.
For more information, go to
www.siemens.com/industrialsecurity

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SIEMENS

So strong and so compact

Space-saving versions of the SIMATIC S7-1500 Advanced Controller

CPU 1511C and CPU 1512C

Added value, small space requirement

The two S7-1500 compact CPUs 1511C and CPU 1512C round off the SIMATIC S7-1500 product line. These CPUs are designed for an application where space-saving is a requirement, as in OEM machine manufacturing.

Both S7-1500 compact CPUs are characterized by high performance. Technology functions such as counting, measuring and positioning are integrated in the hardware. The engineering is performed using TIA Portal – with its uniform control concept for consistent functionality.

The 1500C provides the further customer benefits of low acquisition costs with integrated technological functions and IO. No additional modules need to be purchased for this functionality. The result is reduced inventory.
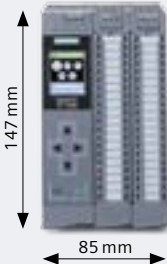
Highlights

- CPU as well as inputs and outputs in one enclosure
- High bit performance: CPU 1511C-1 PN with 60 ns and CPU 1512C-1 PN with 48 ns
- Efficient engineering in the TIA Portal
- Functional consistency and scalability within the Advanced Controllers – in both price and performance

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Progress within narrow confines:
CPU 1511C and CPU 1512C

With a width of 85 mm, the CPU 1511C-1 PN provides 32 digital IO ports as well as 5 analog inputs and 2 analog outputs. The CPU 1512C-1 PN is a mere 110 mm wide and features 64 digital IO connections, 5 analog inputs and 2 analog outputs.

If required, they can be expanded to include additional connections using signal modules to make them a perfect fit for your specific requirements.

Technical specifications	CPU 1511C-1 PN	CPU 1512C-1 PN
Width	85 mm (extendable using 25/35 mm IO modules)	110 mm (extendable using 25/35 mm IO modules)
PROFINET interface with 2 ports	Yes	Yes
PROFINET IRT	Yes	Yes
Web server	Yes	Yes
Display	Yes	Yes
Work memory	175 kB program, 1 MB data	250 kB program, 1 MB data
Bit performance	60 ns	48 ns
Integral digital inputs/outputs	• 16 DI • 16 DO	• 32 DI • 32 DO
Integral analog inputs/outputs	4 AI (U/I) + 1 AI RTD, 2 AO (U/I)	4 AI (U/I) + 1 AI RTD, 2 AO (U/I)
Technology integration	• 6 x HSC, 100 kHz • 4 x PTOs / PWMs, 100 kHz*	• 6 x HSC, 100 kHz • 4 x PTOs / PWMs, 100 kHz*
Configurable with	STEP 7 V13 SP1 Update 4	STEP 7 V13 SP1 Update 4

*not in the first stage of delivery (possible with later firmware version)