SIMATIC ET 200SP CPU
The Controller for Distributed Intelligence
**SIMATIC ET 200 – Distributed Controllers (for ET200s and ET200pro)**

Popular Distributed controller for previous generation of products

*Data for IM154-8 not shown – specs similar to S7-300 CPU315-2 PN/DP*
ET 200SP CPU – Now we have a modern controller line up
Identical Architecture for Advanced and Distributed Controllers!

TIA Portal

S7-1500 architecture

S7-1500

Advanced Controller

ET 200SP CPU

Distributed Controller

S7-1200

Basic Controller
SIMATIC Distributed Controller
The compact controller in the S7-1500 series

Advanced Controller
SIMATIC S7-1500

Distributed Controller
SIMATIC ET 200SP controller
S7-1510/S7-1512

Software Controller
SIMATIC S7-1500

Engineered in the TIA Portal

System performance

Application complexity
SIMATIC S7-1500 / ET 200 SP CPUs
Highlights with Firmware V1.8 in TIA Portal V13 SP1 UPD4

Hardware Innovations

+ SIMATIC S7-1500 Compact-CPUs
+ faster Startup sequence
+ New Hardware for
  - each S7-1500(F) CPUs \(\leq 1516(F)\)
  - each ET 200SP(F) CPUs
+ ET 200SP CPU:
  - support FO-Adapter (with new HW)
  - support ASi-Master

Programming

+ Additional functionality for block “T_Config” (IP-address of the NTP-Servers can be changed during runtime)

New Features

+ Support SIMATIC S7 App
+ New features for display and webserver
  + Write tags / tag status via display and webserver
Increased intelligence in machine-level applications

SIMATIC ET 200SP Controller
ET 200SP CPU
Operator controls and indicators

- PN Port 3 (RJ45)
- BusAdapter (BA)
- PN Port 1 and PN Port 2 (RJ45, FC, SCRJ)
- LEDs: LINK 1 and LINK 2
- LED: LINK 3
- Cable fixing 90° FC plug
- DC 24V plug
- DIN rail unlocking without tools
- Status and error indicators:
  - STOP/RUN: grin/yellow
  - ERROR: red
  - MAINT: yellow
- Label
- Mode selector:
  - RUN/STOP/MRES
- SIMATIC MC card (SD)

Mounting dimensions B x H x T (mm):

100 mm x 117 mm x 75 mm
# ET 200SP CPU

**CPU portfolio standard und failsafe**

<table>
<thead>
<tr>
<th></th>
<th>S7-1510SP</th>
<th>S7-1510SP F</th>
<th>S7-1512SP</th>
<th>S7-1512SP F</th>
<th>CM DP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU type</strong></td>
<td>1510SP -1PN</td>
<td>1510SP F-1PN*</td>
<td>1512SP -1PN</td>
<td>1512SP F-1PN*</td>
<td>DP-Master / DP-Slave*</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td><img src="image1" alt="1" /> <img src="image1" alt="1" /> <img src="image1" alt="1" /></td>
<td><img src="image1" alt="1" /> <img src="image1" alt="1" /> <img src="image1" alt="1" /></td>
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<td><img src="image1" alt="1" /></td>
</tr>
<tr>
<td><strong>Program / Data memory</strong></td>
<td>100 KB 750 KB</td>
<td>150 KB 750 KB</td>
<td>200 KB 1 MB</td>
<td>300 KB 1 MB</td>
<td>125 DP Slaves</td>
</tr>
<tr>
<td><strong>Bit instruction time</strong></td>
<td>72 ns</td>
<td>72 ns</td>
<td>48 ns</td>
<td>48 ns</td>
<td></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>100 mm</td>
<td>100 mm</td>
<td>100 mm</td>
<td>100 mm</td>
<td>35 mm</td>
</tr>
</tbody>
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**ET 200SP CPUs for low and middle range application**

*second delivery step*

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ET 200SP CPU positioning within SIMATIC CPUs
<table>
<thead>
<tr>
<th>Feature/function</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>High system performance</td>
<td>• Fast, equidistant and isochronous data transfer - This enables synchronous backplane bus communication</td>
</tr>
<tr>
<td></td>
<td>• Modules can be replaced during operation</td>
</tr>
<tr>
<td></td>
<td>• Replacement of several modules possible</td>
</tr>
<tr>
<td>Hot swapping and multi hot swapping</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Electrical isolation between 2 stations possible</td>
</tr>
<tr>
<td>Flexible bus connection via copper or fiber-optic BusAdapter</td>
<td>• Media change from FOC to copper directly in the BusAdapter</td>
</tr>
<tr>
<td></td>
<td>• Cable lengths of over 100 m possible</td>
</tr>
</tbody>
</table>
SIMATIC Distributed Controller
The compact controller in the S7-1500 family

- **Compact design**
  - High channel density of I/O modules with intelligent cable routing

- **Efficient engineering**
  - Consistent engineering in the TIA Portal

- **Extensive module range**
  - A wide variety of tasks such as weighing, counting and energy acquisition with only one I/O system

- **Improved security**
  - Protection of intellectual property and protection against manipulation

- **Openness for PC applications**
  - Integration of high-level languages and Windows applications with simultaneous independence of the controller from the operating system
## SIMATIC Distributed Controller

Integrated system functions save time during engineering

### Feature/function

<table>
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<tr>
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<tbody>
<tr>
<td>• Integrated know-how and access protection</td>
</tr>
<tr>
<td>• Manipulation protection</td>
</tr>
<tr>
<td>• Integrated technology functions</td>
</tr>
<tr>
<td>• Integrated system diagnostics without generating a line of code</td>
</tr>
<tr>
<td>• Integrated Web server</td>
</tr>
</tbody>
</table>

### Benefits

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<tr>
<th>Benefits</th>
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<tbody>
<tr>
<td>• Protection against unauthorized reading</td>
</tr>
<tr>
<td>• Protection against unauthorized duplication</td>
</tr>
<tr>
<td>• Protection against network attacks</td>
</tr>
<tr>
<td>• Protected transmission of passwords</td>
</tr>
<tr>
<td>• Time savings in the engineering phase</td>
</tr>
<tr>
<td>• No additional programming workload</td>
</tr>
<tr>
<td>• Fast localization of faults</td>
</tr>
<tr>
<td>• Remote access to the controller, even if Windows fails</td>
</tr>
</tbody>
</table>
ET 200SP CPU
Overview

- Memory concept, quantity structure and features of a SIMATIC S7-1500 CPU
- 2 CPU type: 1510SP-1 PN & 1512SP-1 PN
- Ca. factor 5 more memory as ET 200S CPUs
- PROFINET interface with 3 Ports
- PROFINET RT/IRT
- Webserver
- Optional PROFIBUS DP over CM DP Master / Slave* module
- Technology integration:
  - Standard Motion Control / PID
- Configuration control (Option handling)
- Each CPU also as Failsafe type *
- Engineering: STEP7 Professional from V13 Update2

* second delivery step
ET 200SP CPU
Design
ET 200SP CPU
1510SP-1 PN CPU

- Memory concept, quantity structure and features of a S7-1500 1511-1 PN CPU
- Work memory
  - Program: 100 kByte, Data: 750 kByte
- Performance
  - Bit instruction time: 72 ns
  - User program performance comparable with S7-300 314 CPU
- PROFINET IO-Controller for 64 Devices
- PROFINET iDevice
- PROFINET Shared iDevice for 4 Controller
- Open User Communication (TCP/IP, ISO-on-TCP, UDP)
- Median redundancy (with BusAdapter)
ET 200SP CPU
1512SP-1 PN CPU

- Memory concept, quantity structure and features of a S7-1500 1513-1 PN CPU
- Work memory
  - Program: 200 kByte, Data: 1 MByte
- Performance
  - Bit instruction time: 48 ns
  - User program performance comparable with S7-300 315 CPU
- PROFINET IO-Controller for 128 Devices
- PROFINET iDevice
- PROFINET Shared iDevice for 4 Controller
- Open User Communication (TCP/IP, ISO-on-TCP, UDP)
- Median redundancy (with BusAdapter)
- Support of 2xSCRJ BusAdapter*

* second delivery step
ET 200SP CPU
Optional PROFIBUS DP Master/Slave module „CM DP“

Functionality (like DP interface of CPU 1516-3 PN/DP)
- PROFIBUS DP-Master for 125 DP-Slaves
  - PG- / OP-Communication
  - S7-Routing
  - Activation/deactivation of DP slaves
- PROFIBUS DP-Slave*
  - PG- / OP-Communication
  - S7-Routing

Type of interface
- Physics: RS 485
- electrically isolated
- Transmission rates: Up to 12 Mbaud
- Max. 1 module per CPU

Mounting dimensions (W x H x D) mm: 35 x 117 x 75

* (second delivery step)
ET 200SP CPU
Variable Bus Connection via BusAdapter

Universal interface for bus connection => freely selectable physics and connection system via BusAdapters depending on the application area

Standard load

+ Increased mechanical and EMC load

+ Increased potential difference

Media converter (FOC ↔ copper))

BA 2xRJ45
BA 2xCFc*
BA 2xSCRJ**
BA SCRJ+FC

*FastConnect
**Fiber-optic cables (second delivery step, for CPU 1512SP-1 PN)
ET 200SP CPU
Highlights

Engineered in the TIA Portal

S7-1500 architecture

Flexible bus adapter

Compact design

Module spectrum of ET 200SP
ET 200SP CPU Portfolio

Bus adapter  CPU  Signal modules  Safety (later delivery stage)  Communication modules  Technology modules  Base unit
## ET 200SP CPU
User-Friendly Products, High Efficiency and Scalable Product Portfolio

<table>
<thead>
<tr>
<th>Feature / function</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFINET on board</td>
<td>Web server for service and diagnostics information</td>
</tr>
<tr>
<td>Integrated technology</td>
<td>Perfect drive integration via motion control functions and PROFIdrive</td>
</tr>
<tr>
<td>Integrated trace / diagnostics functionality</td>
<td>Program and application diagnostics in realtime for the detection of even sporadic errors</td>
</tr>
<tr>
<td>Utilization of all TIA Portal advantages</td>
<td>Efficient programming, commissioning and service tools for maximum engineering efficiency</td>
</tr>
</tbody>
</table>
SIMATIC Distributed Controller
Fast time-to-production through time savings during configuration

Efficient engineering with the TIA Portal
- No Windows setting necessary for the Software Controller
- Integrated system diagnostics
- Simple integration of high-level languages in STEP 7

Consistency within the ET 200SP family
- Scalable performance up to PC-based CPU
- Expandable with technology and communication modules
- Space saving through granular I/O modules and single-tier configuration with up to 64 modules

Option handling for different configurations
- Only one project for various machine versions
- Simple upgrading without engineering
- Increased added value added through upgrade possibilities
SIMATIC PC Based Distributed Controller
The compact controller also comes in a PC-Based controller

- Is it important to you to have a consistent functions of an S7-1500 with a compact and distributed controller?

- Do you want to use a space-saving overall system that you can expand flexibly as required?

- Do you need the performance of a PC-based controller but do not wish your system availability to be dependent on Windows?

➔ Assemble your SIMATIC ET 200SP Controller under www.siemens.com/tia-selection-tool---
www.siemens.com/tia-selection-tool
SIMATIC Distributed Controller
Use the capabilities of a PC-based controller simply and flexibly

### Complex control tasks
- Realization of short cycle times
- Integration of complex control algorithms
- High program and data memory capacity

### Integration of PC applications
- Integration of (existing) high-level language code
- Direct integration of controllers from model-based development

### Multiple tasks on one device
- Controller, HMI and Windows applications on one CPU
- Functions can be centrally expanded with ET 200SP modules
- Integration of third-party software (e.g. image processing)
SIMATIC ET 200SP The integrated PC Based Open Controller
Application example: Control and visualization of a packaging machine

Advantages:

- **Reduced number of components**: Only one device for control with motion functionality, program, I/Os and technology modules

- **Integration of PC applications**: The Windows-based image processing software runs on the CPU and transfers the data directly to the software controller

- **Increased flexibility**: Different versions of the machine can be realized in a simple manner with option handling and consistency throughout the ET 200SP CPUs.

For machines that need varied capabilities including QC. The quality is monitored by a camera integrated via USB.
Different produces sizes can be selected by means of the HMI.
## SIMATIC Distributed Controller
More than 30% space saved as compared to similar systems

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<tr>
<th>Feature/function</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact design of CPUs with integrated power supply unit</td>
<td>Lower space requirements and reduced component diversity</td>
</tr>
<tr>
<td>High channel density of I/O modules with intelligent cable routing</td>
<td>Lower space requirements with adherence to the bending radiiuses</td>
</tr>
<tr>
<td>Single-tier configuration with up to 64 modules</td>
<td>No need for a second mounting rail or an additional interface module</td>
</tr>
</tbody>
</table>