

Products for Totally Integrated  
Automation and Micro Automation

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# simatic

**SIEMENS**



Products for  
Totally Integrated Automation  
and Micro Automation

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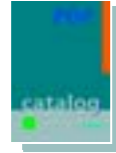
**Siemens AG**  
Automation and Drives  
Industrial Automation Systems  
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FEDERAL REPUBLIC OF GERMANY  
[www.siemens.com/automation](http://www.siemens.com/automation)

Order No.: E86060-K4670-A111-A9-7600

## Related catalogs

**SIMATIC**  
SIMATIC S5/505  
Automation systems  
Available as PDF only:  
[http://www.siemens.com/automation/simatic/ftp/st50/html\\_76/st5098\\_e.pdf](http://www.siemens.com/automation/simatic/ftp/st50/html_76/st5098_e.pdf)

ST 50



**Industrial Communication**  
Industrial Communication  
for Automation and Drives

IK PI



Order No.:  
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**SIMATIC HMI**  
Human Machine  
Interface Systems

ST 80



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**PC-based Automation**

ST PC



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**SITRAIN Information and Training**  
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**Catalog CA01 -**  
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CA 01



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# Products for Totally Integrated Automation and Micro Automation

Catalog ST 70 · 2005

Supersedes:  
Catalog ST 70 · 2003

The products contained in this  
catalog are also contained in  
the electronic catalog CA 01  
Order No.:  
E86060-D4001-A100-C3-7600

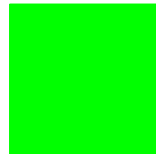
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THE INTERNATIONAL CERTIFICATION NETWORK

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# SIEMENS

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## Welcome to Automation and Drives

We would like to welcome you to Automation and Drives and our comprehensive range of products, systems, solutions and services for production and process automation and building technology worldwide.

With Totally Integrated Automation and Totally Integrated Power, we deliver solution platforms based on standards that offer you a considerable savings potential.

Discover the world of our technology now. If you need more detailed information, please contact one of your regional Siemens partners.

They will be glad to assist you.

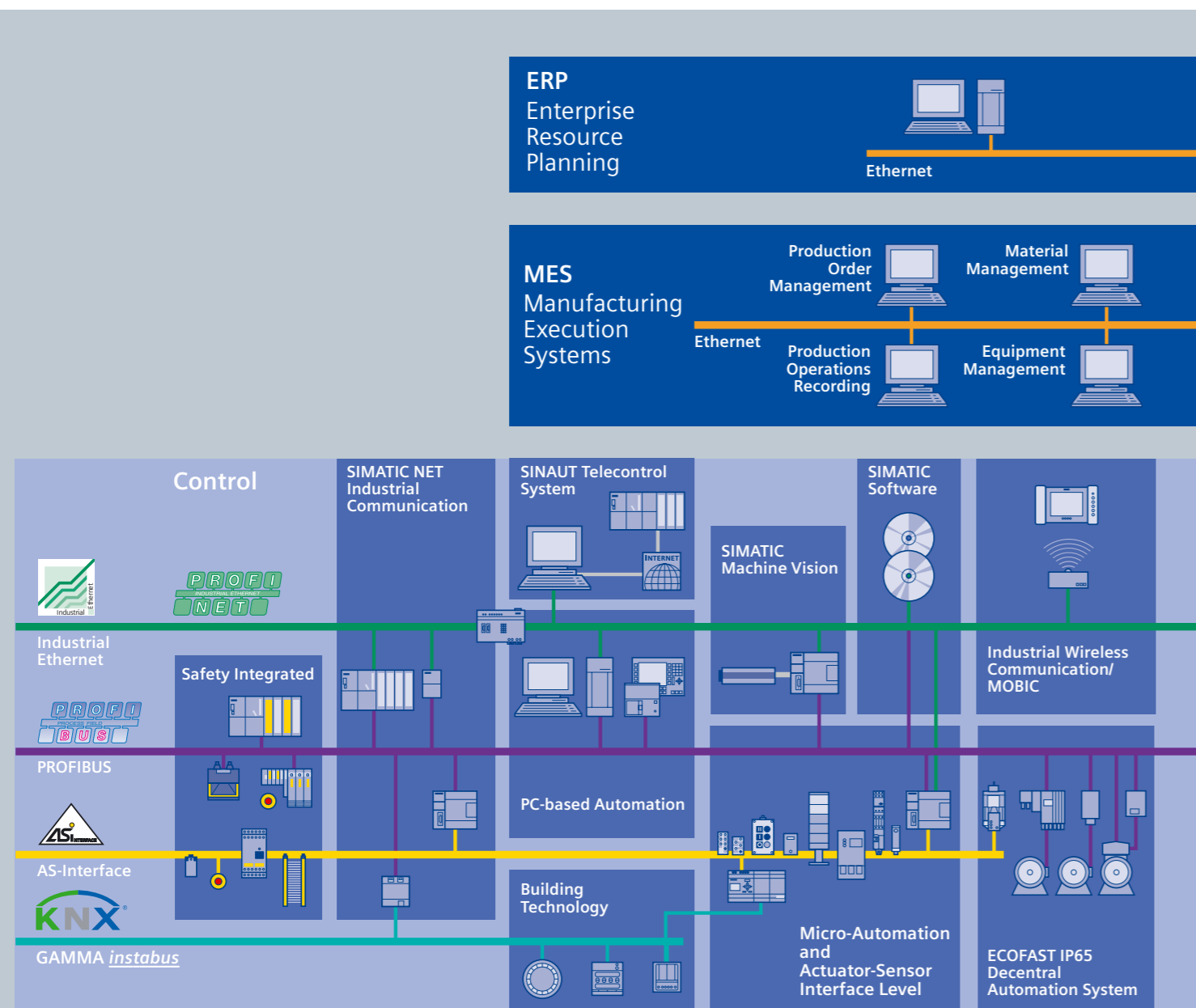




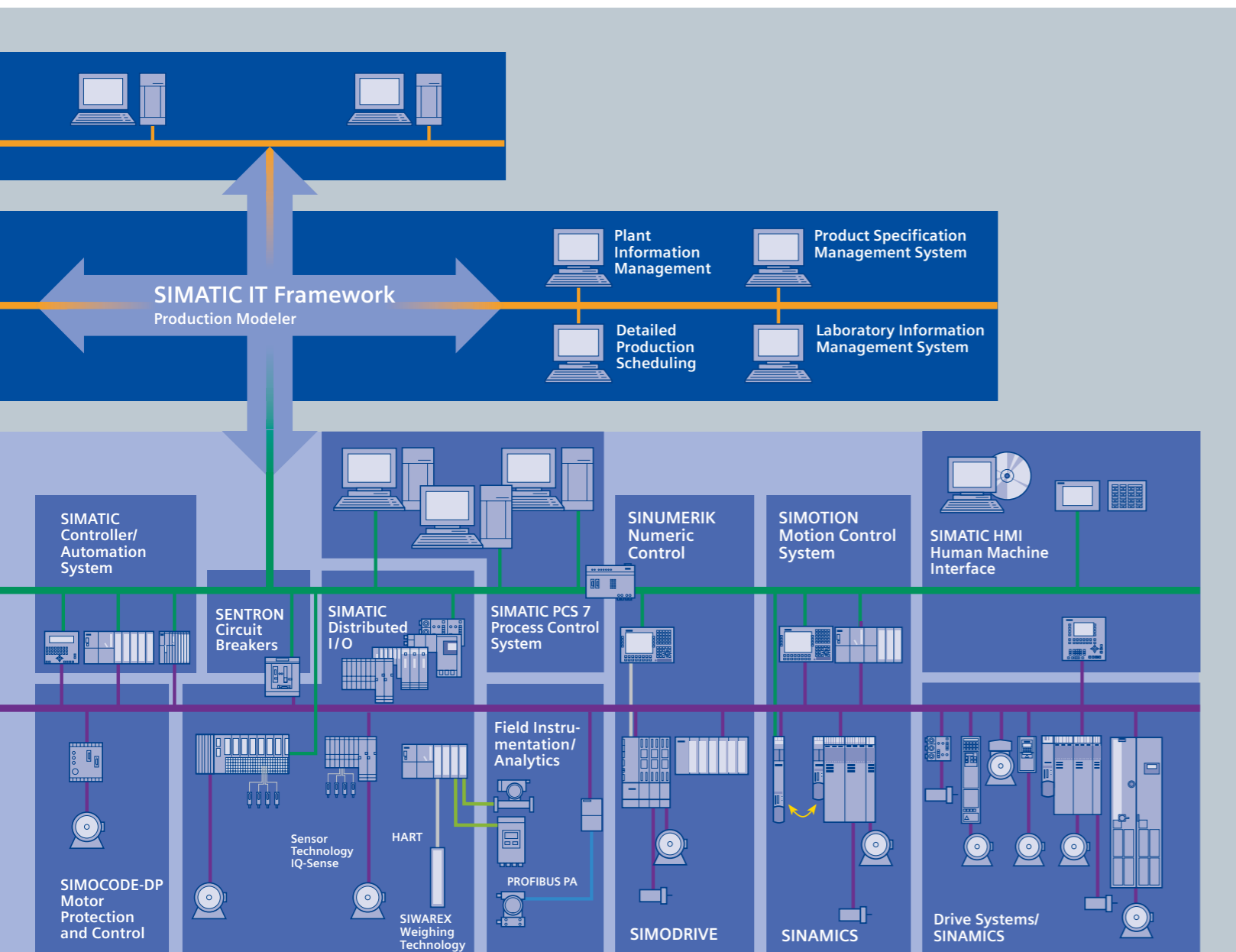


# Totally Integrated Automation – innovations for more productivity

With the launch of Totally Integrated Automation, we were the first ones on the market to consistently implement the trend from equipment to an integrated automation solution, and have continuously improved the system ever since. Whether your industry is process- and production-oriented or a hybrid, Totally Integrated Automation is a unique "common solution" platform that covers all the sectors. Totally Integrated Automation is an integrated platform for the entire production line - from receiving to technical processing



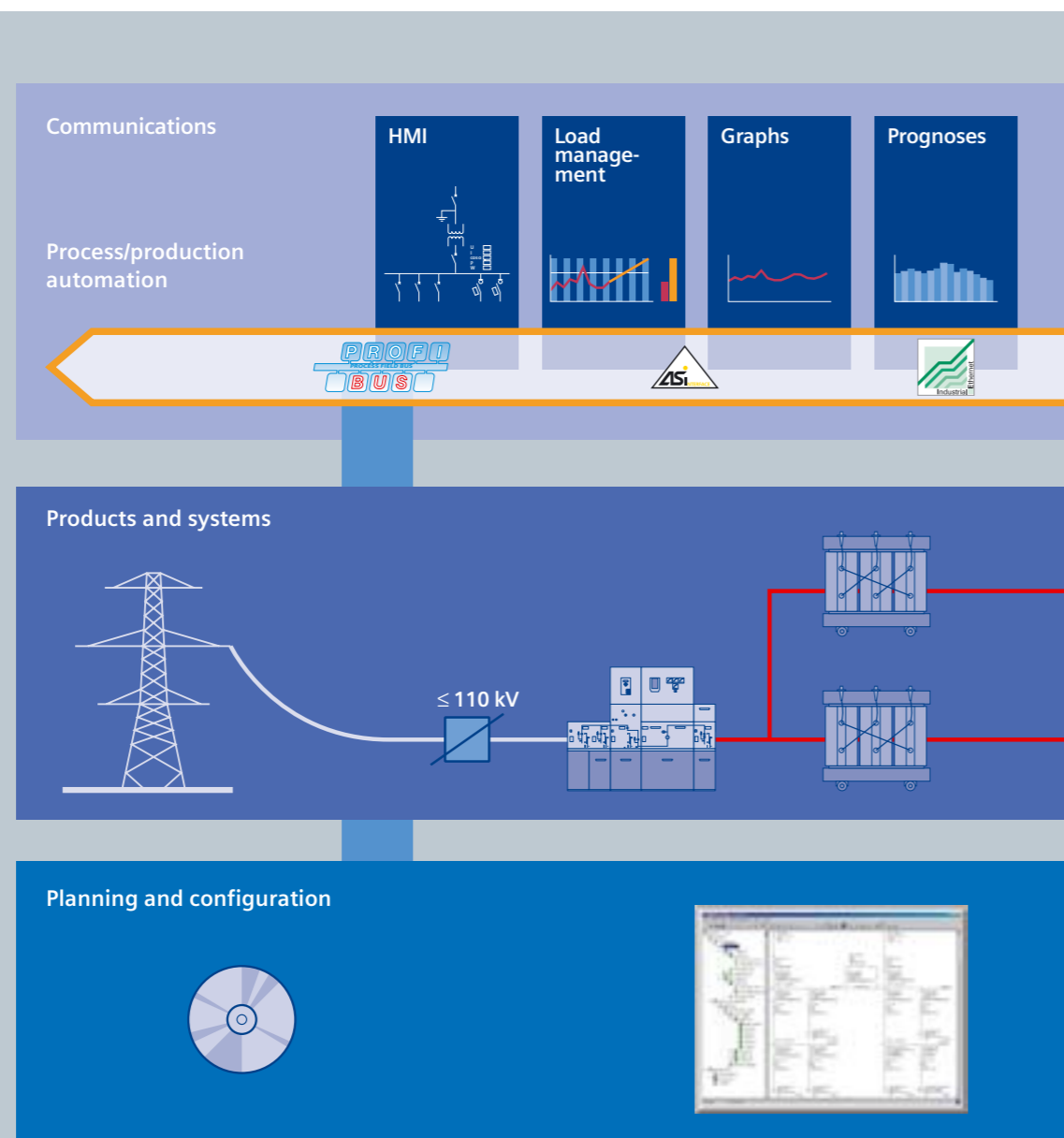
and production areas to shipping. Thanks to the system-oriented engineering environment, integrated, open communications as well as intelligent diagnostics options, your plant now benefits in every phase of the life cycle. In fact, to this day we are the only company worldwide that can offer a control system based on an integrated platform for both the production and process industry.



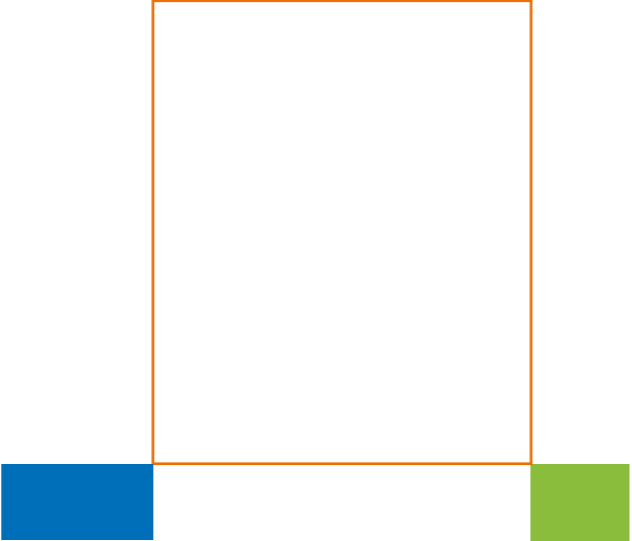
# Totally Integrated Power – energy distribution and management from one source

Totally Integrated Power™ by Siemens offers integrated solutions for energy distribution in functional and industrial buildings covering everything from medium-high voltage to power outlets.

Totally Integrated Power™ is based on integration in planning and configuration as well as coordinated products and systems. In addition, it features communications and software modules for connecting power distribution systems to industrial automation and building automation, thereby offering a substantial savings potential.







**Maintenance**  
 ■ Substation  
 ■ Distribution  
 ■ Maintenance task

**Message/error management**

**Selective protection**

**Protocols**

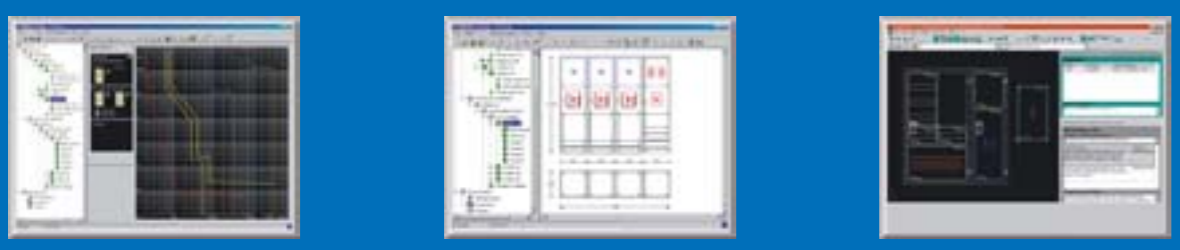
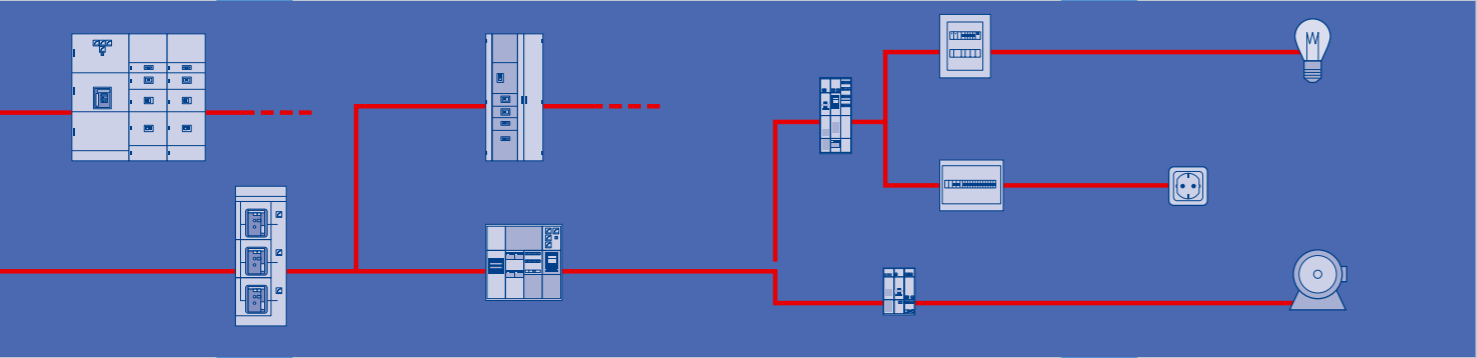
**Power quality**

**Cost center**

**Building automation**

Hall 1 Air conditioning system  
 Distribution 2 Checking  
 Infeed 2 Replacing circuit breaker contacts  
 Replacing meters

BACnet KNX EIB



# Introduction

## Micro Automation

LOGO!:  
Technology with a future  
which simplifies many things

### LOGO! Logic Module

The compact, user-friendly and low-cost solution for simple control tasks.

For universal applications in the industry, non-residential buildings or residential buildings.

No wiring is necessary since functions are linked.

Operates in a similar manner as a PLC.

With integrated operator control and display unit for input of alarm message texts / variables direct at the device.

Easy operation:

- Linking of functions at the click of the mouse at the PC or by pressing a key on the device

Minimum expenditure of time:

- Only the inputs and outputs need to be wired
- Simultaneous wiring diagram generation and control cabinet installation

Reduced costs:

- Many switchgear technology functions are integrated

High flexibility:

- Functions are simply modified at the push of a button
- Variants for different operating voltages
- Modular design, can be expanded at any time

Further information can be found at:

<http://www.siemens.com/logo>



| LOGO!                                      | 24<br>24o  | 12/24RC<br>12/24RCo                                     | 24RC<br>24RCo | 230RC<br>230RCo |
|--|--|---|---------------|-----------------|
| Supply voltage                             | 24 V DC  | 12/24 V DC  | 24 V AC/DC    | 115/230 V AC/DC |
| Inputs                                     | 8 (2 can be used as analog inputs)                   | 8 (2 can be used as analog inputs)                      | 8             | 8               |
| Outputs                                    | 4, transistor  | 4, relay  |               |                 |
| Continuous current                         | 0.3 A  | 10 A (under resistive load); 3 A (under inductive load) |               |                 |
| Short-circuit protection                   | electrical (1 A)                                     | external fuse protection required                       |               |                 |
| Integrated time switches/<br>power reserve | ---  | 8/typ. 80 h   |               |                 |
| Ambient temperature                        | 0 to +55 °C  |   |               |                 |
| RI suppression                             | to EN 50 011 (limit class B)                         |   |               |                 |
| Degree of protection                       | IP20   |   |               |                 |
| Certification                              | to VDE 0631, IEC 1131, UL, FM, CSA, marine approvals |   |               |                 |
| Mounting                                   | on 35 mm DIN rail or wall mounting                   |   |               |                 |
| Dimensions (B x H x T)                     | 72 x 90 x 55 mm (4 width modules)                    |   |               |                 |

■ = can be used/available

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**SIMATIC S7-200:**  
Control technology that  
is a class of its own

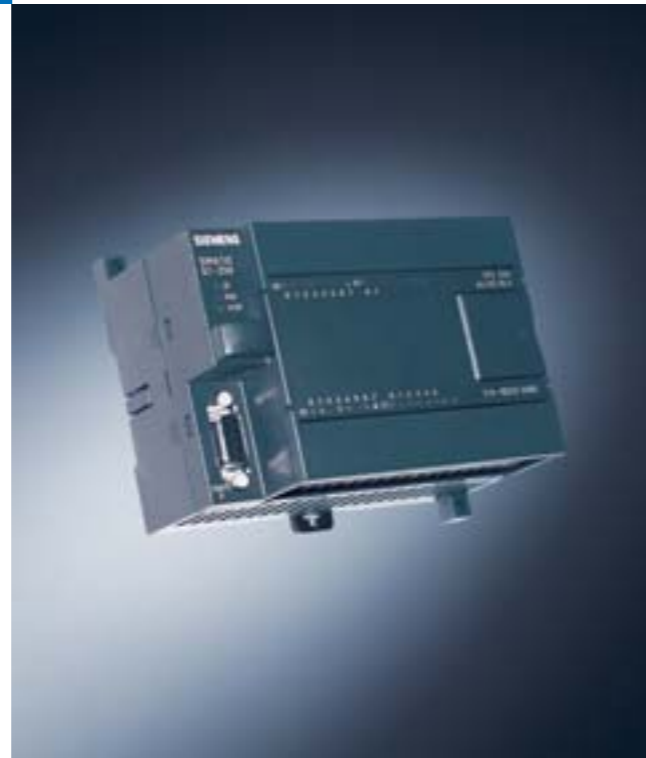
**SIMATIC S7-200**

The Micro PLC SIMATIC S7-200 is truly in a class of its own: it is both compact and highly powerful (e.g. in relation to its real-time response), it is fast, features great communications capabilities and comes with very user-friendly software and hardware.

- Graduated range of CPUs with many basic PLC functions.
- Modular expansion capability for individual adaptations to the respective tasks.
- Can be easily networked over point-to-point interfaces (PPI) with the functions programming, communication, operator control and monitoring.
- Programming with STEP 7-Micro/WIN - a software especially optimized for the performance range of the S7-200.
- Wizards for particularly easy and user-friendly operation.

Further information can be found at:

<http://www.siemens.com/s7-200>



| SIMATIC S7-200                         | CPU 221                     | CPU 222  | CPU 224  | CPU 224 XP   | CPU 226  |
|--|-----------------------------|--|--|--|--|
| Program memory                         | 4 KB                        | 4 KB   | 8/12 KB  | 12/16 KB   | 16 /24 KB  |
| Data memory                            | 2 KB                        | 2 KB   | 8 KB   | 10 KB  | 10 KB  |
| Processing time per binary instruction | 0.22 µs                     | 0.22 µs  | 0.22 µs  | 0.22 µs  | 0.22 µs  |
| Bit memories                           | 256                         | 256  | 256  | 256  | 256  |
| Counters                               | 256                         | 256  | 256  | 256  | 256  |
| Timers                                 | 256                         | 256  | 256  | 256  | 256  |
| Digital inputs/outputs                 | max. 10;<br>10 integrated   | max. 40 / 38;<br>14 integrated                               | max. 94 / 74;<br>24 integrated                               | max. 94 / 74;<br>24 integrated                               | max. 128 / 120;<br>40 integrated                             |
| Analog inputs/outputs                  | ---                         | max. 8/2 or 0/4  | max. 28/7 or 0/14  | max. 28/7 or 0/14<br>3 integrated                            | max. 28/7 or 0/14  |
| HMI devices                            | ■                           | ■  | ■  | ■  | ■  |
| Communication interface                | 1 x PPI<br>(point-to-point) | 1 x PPI<br>(point-to-point)                                  | 1 x PPI<br>(point-to-point)                                  | 2 x PPI<br>(point-to-point)                                  | 2 x PPI<br>(point-to-point)                                  |
| Networking                             | ---                         | AS-Interface<br>PROFIBUS DP<br>Ethernet<br>Internet<br>Modem | AS-Interface<br>PROFIBUS DP<br>Ethernet<br>Internet<br>Modem | AS-Interface<br>PROFIBUS DP<br>Ethernet<br>Internet<br>Modem | AS-Interface<br>PROFIBUS DP<br>Ethernet<br>Internet<br>Modem |
| Real-time clock                        | optional                    | optional   | integrated   | integrated   | integrated   |

■ = can be used/available  
--- = can not be used/not available

# Introduction SIMATIC Controller

**SIMATIC S7-300:**  
For system solutions with focus  
on the manufacturing industry

## SIMATIC S7-300

PLC with modular expansion capability, mainly for applications in the manufacturing industry.

Complete integration in Totally Integrated Automation:

- Efficient configuring and programming with STEP 7 - also with the engineering tools.
- Networking via MPI and SIMATIC NET - now also with PROFINET.

The graduated CPU range, from entry-level CPUs right up to high-performance CPUs, permits short machine cycle times thanks to efficient processing speeds.

The following CPUs are available:

- Standard CPUs, also with integrated PROFINET interface.
- Failsafe CPUs for implementing failsafe applications with the PROFIsafe profile and failsafe signal modules.
- Compact CPUs with integrated I/O, integrated technological functions and integrated communications interfaces for special tasks.
- Technology CPUs with integrated technology and motion control functionality.



| SIMATIC S7-300                   | CPU 312        | CPU 314/<br>315-2 DP | CPU 317-2 DP/<br>317-2 PN/DP | CPU 318-2 DP    | CPU 315F-2 DP        | CPU 317F-2 DP        |
|----------------------------------|----------------|----------------------|------------------------------|-----------------|----------------------|----------------------|
| <b>User memory</b>               | 16 KB          | 48/128 KB            | 512 KB                       | 512 KB          | 192 KB <sup>1)</sup> | 512 KB <sup>2)</sup> |
| Load memory over MMC             | 64 KB to 4 MB  | 64 KB to 8 MB        | 64 KB to 8 MB                | ---             | 64 KB to 4 MB        | 64 KB to 4 MB        |
| <b>Processing times (µs)</b>     |                |                      |                              |                 |                      |                      |
| Bit/word/fixed pt./floating pt.  | 0.2/2/4/6      | 0.1/1/2/3            | 0.05/0.2/0.2/1               | 0.1/0.1/0.1/0.6 | 0.1/1/2/3            | 0.05/0.2/0.2/1       |
| <b>Timers/counters</b>           | 128/128        | 256/256              | 512/512                      | 512/512         | 256/256              | 512/512              |
| <b>Address ranges</b>            |                |                      |                              |                 |                      |                      |
| Digital channels                 | 256            | 1024                 | 1024                         | 1024            | 1024                 | 1024                 |
| Analog channels                  | 64             | 256                  | 256                          | 256             | 256                  | 256                  |
| <b>Interfaces</b>                |                |                      |                              |                 |                      |                      |
| MPI                              | ■              | ■                    | ■                            | ■               | ■                    | ■                    |
| PROFIBUS DP                      | ---            | ■ (315-2 DP)         | ■                            | ■               | ■                    | ■                    |
| PtP communication                | ---            | ---                  | ---                          | ---             | ---                  | ---                  |
| <b>Integrated inputs/outputs</b> |                |                      |                              |                 |                      |                      |
| DI/DO                            | ---            | ---                  | ---                          | ---             | ---                  | ---                  |
| AI/AO                            | ---            | ---                  | ---                          | ---             | ---                  | ---                  |
| <b>Integrated functions</b>      |                |                      |                              |                 |                      |                      |
| Counter/frequency meter          | ---            | ---                  | ---                          | ---             | ---                  | ---                  |
| Pulse outputs                    | ---            | ---                  | ---                          | ---             | ---                  | ---                  |
| Controlling/positioning          | ---/--         | ---/--               | ---/--                       | ---/--          | ---/--               | ---/--               |
| <b>Mounting dim. WxHxD (mm)</b>  | 40 x 125 x 130 | 40 x 125 x 130       | 80 x 125 x 130               | 160 x 125 x 130 | 40 x 125 x 130       | 80 x 125 x 130       |

■ = can be used/available  
--- = can not be used/not available

1) Depends on the programming, e.g. 36 KB F-instructions possible.  
2) Depends on the programming, e.g. 100 KB F-instructions possible.

**SIMATIC S7-300:**  
For system solutions with focus  
on the manufacturing industry

The Micro Memory Card (MMC) as data and program memory renders buffer batteries superfluous. An entire project incl. symbols can be stored on the MMC, enabling simple program updates. Thanks to write and read access in RUN, measured values can be archived and recipes can be processed as well.

Modular expansion capability and up to 3 expansion units.

Modular system with hardware and software components for implementing technological functions.

Thanks to its compact design it is perfectly suited to limited space conditions and distributed configurations.

Easy installation with DIN rail and modules with integrated backplane bus, no need to adhere to slot rules.

Maintenance-free operation without fans.

Powerful diagnostics functionality to achieve a higher availability of the control.

Further information can be found at:  
<http://www.siemens.com/simatic-s7-300>



| SIMATIC S7-300   | CPU 312C                           | CPU 313C                          | CPU 313C-2 PtP/<br>313-2 DP       | CPU 314C-2 DP/<br>314-2 DP      | CPU 317T-2 DP  |
|--|------------------------------------|-----------------------------------|-----------------------------------|---------------------------------|--|
| <b>User memory</b><br>Load memory over MMC   | 16 KB<br>64 KB to 4 MB             | 32 KB<br>64 KB to 4 MB            | 32 KB<br>64 KB to 4 MB            | 48 KB<br>64 KB to 4 MB          | 512 KB<br>4 MB to 8 MB   |
| <b>Processing times (µs)</b><br>Bit/word/fixed pt./floating pt.                                    | 0.2/2/4/6                          | 0.1/1/2/3                         | 0.1/1/2/3                         | 0.1/1/2/3                       | 0.05/0.2/0.2/0.1   |
| <b>Timers/counters</b>   | 128/128                            | 256/256                           | 256/256                           | 256/256                         | 512/512  |
| <b>Address ranges</b><br>Digital channels<br>Analog channels                                       | 266<br>64                          | 1016<br>253                       | 1008<br>248                       | 1016<br>253                     | 256<br>64  |
| <b>Interfaces</b><br>MPI<br>PROFIBUS DP<br>PtP communication                                       | ■<br>---<br>---                    | ■<br>---<br>---                   | ■<br>■<br>ASCII, 3964R 1)         | ■<br>■<br>ASCII, 3964R 1)       | ■<br>■<br>---  |
| <b>Integrated inputs/outputs</b><br>DI/DO<br>AI/AO   | 10/6<br>---                        | 24/16<br>4/2                      | 16/16<br>---                      | 24/16<br>4/2                    | 4/8<br>---   |
| <b>Integrated functions</b><br>Counter/frequency meter<br>Pulse outputs<br>Controlling/positioning | 2 (10 kHz)<br>2 (2.5 kHz)<br>--/-- | 3 (30 kHz)<br>3 (2.5 kHz)<br>■/-- | 3 (30 kHz)<br>3 (2.5 kHz)<br>■/-- | 4(60 kHz)<br>4 (2.5 kHz)<br>■/■ | <b>Technological functions, e.g.</b><br>gearbox and contour synchronism,<br>travel/time-dependent cam<br>switching, controlled positioning |
| <b>Mounting dim. WxHxD (mm)</b>  | 80 x 125 x 130                     | 120 x 125 x 130                   | 120 x 125 x 130                   | 120 x 125 x 130                 | 160 x 125 x 130  |

■ = can be used/available  
--- = can not be used/not available

1) CPU 31x-2 PtP

2) CPU 31x-2 DP

# Introduction

## SIMATIC Controller

**SIMATIC S7-400:**  
For system solutions in production technology and process engineering

### SIMATIC S7-400

PLC with excellent dynamics for system solutions in the manufacturing and process technology.

Completely integrated in Totally Integrated Automation:

- Efficient configuring and programming with STEP 7 and the engineering tools.
- Networking via MPI and SIMATIC NET.

Extremely high level of performance with very short command processing times and deterministic response times. Well suited for executing programs involving many computing tasks.

Fast communication via Ethernet and efficient connection down to the field level via PROFIBUS.

Versatile module range:

- Graded CPU performance, additionally multi-computing
- Function and communication modules for technological tasks, networking and connection to the IT world

Hot swapping of the signal modules.

Efficient configuring with high-level languages, e.g. SCL, and graphical engineering tools.

Powerful diagnostics functions to achieve a higher availability of the control.

Storage of all project data (e.g. program sources) direct on the CPU to support with service jobs.

Special variants - based on the standard PLC - for applications with demands on the high availability and fail-safety as well as PC-based solutions.



Further information can be found at:

<http://www.siemens.com/simatic-s7-400>

| SIMATIC S7-400 with                         | CPU 412-1<br>CPU 412-2                     | CPU 414-2<br>CPU 414-3                     | CPU 416-2/<br>416-3/417-4                  | CPU 414-4H<br>CPU 417-4H<br>for S7-400H/FH | CPU 416F<br>for S7-400F                    |  |
|---|--|--|--|--|--|--|
| User memory for program                     | 72 (128 <sup>1)</sup> ) KB                 | 256 (700 <sup>2)</sup> ) KB                | 1.4/2.8 <sup>3)</sup> /10 <sup>4)</sup> MB | 700 KB                                     | 10 MB                                      | 1.4 MB                                     |
| User memory for data                        | 72 (128 <sup>1)</sup> ) KB                 | 256 (700 <sup>2)</sup> ) KB                | 1.4/2.8 <sup>3)</sup> /10 <sup>4)</sup> MB | 700 KB                                     | 10 MB                                      | 1.4 MB                                     |
| Processing time per 1 K Binary instructions | 0.1 ms                                     | 0.06 ms                                    | 0.04 (0.03 <sup>4)</sup> ) ms              | 0.06 ms                                    | 0.03 ms                                    | 0.03 ms                                    |
| Bit memories                                | 4096                                       | 8192                                       | 16384                                      | 8192                                       | 16384                                      | 16384                                      |
| Counters                                    | 2048                                       | 2048                                       | 2048                                       | 2048                                       | 2048                                       | 2048                                       |
| Timers                                      | 2048                                       | 2048                                       | 2048                                       | 2048                                       | 2048                                       | 2048                                       |
| Digital channels of which central           | 32768/32768                                | 65536/65536                                | 131072/131072                              | 65536/65536                                | 131072/131072                              | 131072/131072                              |
| Analog channels of which central            | 2048/2048                                  | 4096/4096                                  | 8192/8192                                  | 4096/4096                                  | 8192/8192                                  | 8192/8192                                  |
| HMI devices                                 | ■  | ■  | ■  | ■  | ■  | ■  |
| Communications interface                    | MPI (multi-point interface)<br>PROFIBUS DP | MPI (multi-point interface)<br>PROFIBUS DP | MPI (multi-point interface)<br>PROFIBUS DP | MPI (multi-point interface)<br>PROFIBUS DP | MPI (multi-point interface)<br>PROFIBUS DP | MPI (multi-point interface)<br>PROFIBUS DP |
| Networking                                  | PROFIBUS<br>Ind. Ethernet                  | PROFIBUS<br>Ind. Ethernet                  | PROFIBUS<br>Ind. Ethernet                  | PROFIBUS<br>Ind. Ethernet                  | PROFIBUS<br>Ind. Ethernet                  | PROFIBUS<br>Ind. Ethernet                  |
| Real-time clock                             | integrated                                 | integrated                                 | integrated                                 | integrated                                 | integrated                                 | integrated                                 |

■ = can be used/available

--- = can not be used/not available

1) CPU 412-2

2) CPU 414-3

3) CPU 416-3

4) CPU 417-4



**SIMATIC C7:  
PLC and OP in  
one compact unit**

**SIMATIC C7**

Compact unit for implementing complete machine control systems incl. visualization where space is at a premium, e.g. for the manufacturing industry or simple process engineering tasks.

Low-cost solution consisting of an S7-300 CPU and a line-oriented or pixel-graphics operator panel, i.e. PLC and OP basic functionality in one device.

Compact housing that is easily installed, with permanent wiring, rugged membrane keyboard, and backlit display.

Supports Cyrillic and various Asian character sets (Chinese, Korean, Japanese).

Customized design for optimum adaptation to the machine.

Low engineering overhead with STEP 7 programming.

ProTool/WinCC flexible configuration and use of the shared data management system.

Product variants with regard to communication interfaces (MPI, DP), onboard I/O and S7-300 modules can be added, e.g. also for technological tasks.

Further information can be found at:

<http://www.siemens.com/simatic-c7>



| SIMATIC C7  | C7-613                                     | C7-633/P<br>C7-633 DP   | C7-635 Key<br>C7-635 Touch                      | C7-636 Key                               |
|---|--|---|---|--|
| PLC-CPU   | CPU 313C                                   | CPU 315 <sup>1)</sup> /<br>CPU 315-2 DP <sup>2)</sup>   | CPU 314C-2 DP                                   | CPU 315-2 DP                             |
| CPU user memory                                   | 32 KB                                      | 48 <sup>1)</sup> /64 <sup>2)</sup> KB   | 64 KB   | 128 KB                                   |
| OP  | ---  | OP 7  | OP 170/<br>TP 170B <sup>3)</sup>                | OP 270                                   |
| Number lines x characters<br>per line, resolution | 4 x 20                                     | 4 x 20  | Pixel, vector graphics<br>320 x 240             | Pixel, vector graphics<br>320 x 240      |
| I/O   | 24 DI<br>16 DO<br>4 AI + 1 Pt100<br>2 AO   | 16 DI <sup>1)</sup><br>16 DO <sup>1)</sup><br>4 AI <sup>1)</sup><br>4 AO <sup>1)</sup><br>4 alarm/counter/<br>frequency <sup>1)</sup> | 24 DI<br>16 DO<br>4 AI + 1 Pt100<br>2 AO        | 24 DI<br>16 DO<br>4 AI + 1 Pt100<br>2 AO |
| Communication<br>interface                        | MPI  | MPI<br>PROFIBUS DP<br>(Master/Slave) <sup>2)</sup>  | MPI<br>PROFIBUS DP<br>(Master/Slave)            | MPI<br>PROFIBUS DP<br>(Master/Slave)     |
| Programming<br>PLC part<br>HMI part               | STEP 7 Lite, STEP 7<br>STEP 7 Lite, STEP 7 | STEP 7 Lite <sup>1)</sup> , STEP 7<br>ProTool Lite, ProTool,<br>ProTool/Pro, WinCC flexible <sup>2)</sup>                             | STEP 7<br>ProTool Lite, ProTool,<br>ProTool/Pro | STEP 7<br>WinCC flexible                 |

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 --- = can not be used/not available

1) only C7-633/P  
 2) only C7-633 DP  
 3) C7-635 Touch

# Introduction

## SIMATIC PG

**SIMATIC PG:**  
Complete programming tools  
and fully-fledged PC

Completely equipped programming tools for the SIMATIC Controllers and other automation components

- Programming software installed ready for operation
- All required interfaces and connecting cables are included

With the Windows operating system installed it is also a fully-fledged PC for all types of office applications.

Rugged, industry-standard design with high resistance to shock and vibration and immunity to interference.

### SIMATIC Field PG®

Mobile and industry-standard PG in notebook computer format.

Designed mainly for commissioning, service and maintenance of automation systems.

Thanks to its compact dimensions and weight of less than 4 kg, it can be optimally used at locations where space is at a premium.

With high-performance lithium ion battery for several hours of off-mains operation.

### SIMATIC Power PG®

Flexible programming workstation with powerful components from the Desktop PC segment.

Designed mainly for configuring and programming as well as simulations and tests.

With wireless full PC keyboard that can be placed anywhere on your desk.

Further information can be found at:

<http://www.siemens.com/simatic-pg>



| SIMATIC PG                | Field PG   | Power PG  |
|---------------------------|--|---|
| <b>Design</b>             | Notebook computer  | Mobile computer   |
| <b>Processor</b>          | Mobile Intel Pentium 4, 2.2 GHz<br>incl. 512 KB 2nd level cache;   | Mobile Intel Pentium 4, 2.2 GHz<br>incl. 512 KB 2nd level cache |
| <b>Main memory</b>        | 256 MB, can be expanded to max. 1 GB   | 512 MB, can be expanded to max. 1.5 GB                          |
| <b>Display</b>            | 14.1" TFT, resolution 1024 x 768<br>optional 1400 x 1050   | 15" TFT, resolution 1024 x 768<br>optional 1400 x 1050          |
| <b>PC slots</b>           | --   | 2 x PCI (1 x long, 1 x short)                                   |
| <b>Keyboard</b>           | Notebook keyboard without numeric pad  | Wireless, standard keyboard with numeric pad                    |
| <b>Hard disk</b>          | 40 GB, optional 80 GB; 2.5"  | 80 GB; 3.5"   |
| <b>DVD-ROM/CD-ROM</b>     | DVD-ROM/CD-RW drive<br>optional DVD-ROM/DVD-RJ-RW drive  |   |
| <b>SIMATIC interfaces</b> | 1 x MPI/DP   |   |
| <b>PC interfaces</b>      | PCMCIA, 1 x Type III or 2 x Type II<br>1 x COM 1<br>1 x COM 2<br>2 x USB 2.0<br>1 x Fast Ethernet 10/100 MB/s<br>1 x LPT |   |

# Introduction

## SIMATIC PC

**SIMATIC PC:**  
Always the right  
industrial PC

Professional automation solutions place varying, high demands on the industrial PCs used - vibration, low temperatures, heat, steam - year after year and around the clock. SIMATIC PCs are the ideal industry-standard PC platforms for this environment. SIMATIC PCs can offer

- high system availability,
- high investment protection,
- excellent industrial functionality.

A wide range of different designs is available for different applications:

### SIMATIC Box PC

Compact and rugged industrial PC for installation direct at the machine.

### SIMATIC Rack PC

Flexible industrial PC for installation in 19" cabinets.

### SIMATIC Panel PC

Compact industrial PC for operator control and monitoring direct on site. SIMATIC PCs can be individually configured. Special customer requests, for example regarding design, and hardware expansions can be implemented project-specifically. For individually expanding the system availability, there are add-on components that are perfectly matched to each other. SIMATIC PCs are the ideal platform for PC-based automation and can be used in the manufacturing and process industry as well as in semi-industrial applications, such as transport systems, building management systems and warehouse systems.

Further information can be found at:

<http://www.siemens.com/simatic-pc>



| Box PC  | Rack PC  | Panel PC   |
|---|--|--|
| <b>SIMATIC Microbox PC 420</b><br>Ultra-compact for use directly at the machine<br>Maintenance-free thanks to operation without fan and hard disk<br>PC components from the Intel Embedded line with long-term availability<br>Scalable and expandable with up to 3 PC/104/Plus modules<br>High system availability by rugged, EMC-suitable design<br>Long-term availability of spare parts | <b>SIMATIC Rack PC Industrial Lite 40 S</b><br>High performance and scalability<br>PCI- and AGP-Slots<br>CE marking for industry and office<br>Dust protection<br>Service-friendly<br>Transportation lock for expansion cards<br>Monitoring functions<br>Long-term availability of spare parts                                   | <b>SIMATIC Panel PC Industrial Lite 70 and 77</b><br>Low-cost entry-level version for basic industrial requirements<br>Basic industrial capability:<br>vibration load 0.25 g, shock 1.0 g (in operation)<br>High electromagnetic compatibility:<br>CE marking for industrial applications<br>Latest PC technology<br>PCI slots   |
| <b>SIMATIC Box PC 620 and 840</b><br>High-performance processor<br>Maximum compactness and performance<br>Can be operated at high temp. levels<br>Powerful diagnostics<br>Integrated PROFIBUS/MPI interface (optional)<br>ISA- and PCI-Slots<br>High flexibility and expandability with the components<br>Long-term availability of spare parts   | <b>SIMATIC Rack PC 840</b><br>Protection against vibration/shock during operation<br>Can be operated at high temp. levels<br>Efficient self-diagnostics<br>Integrated PROFIBUS/MPI interface (optional)<br>ISA- and PCI-Slots<br>High flexibility and expandability with the components<br>Long-term availability of spare parts | <b>SIMATIC Panel PC 670 and 870</b><br>Rugged high-performance PC<br>High industrial capability:<br>vibration load 1.0 g, shock 5.0 g (in operation)<br>High electromagnetic compatibility:<br>CE marking for industrial applications<br>High industrial functionality:<br>PROFIBUS/MPI integrated, Ethernet on board<br>ISA and PCI slots<br>Low mounting depth (Panel PC 670),<br>Maximum expandability (Panel PC 870)<br>Optional direct control key module<br>Distributed configuration (optional)<br>PC diagnostics/signaling software<br>Second hard disk (optional) |

# Introduction

## SIMATIC Industrial Software

The future-oriented software basis

SIMATIC Industrial Software is one of the main components of Totally Integrated Automation and offers the perfect tool for any automation task and project phase. Whether in manufacturing or process technology, in mechanical or plant engineering, with SIMATIC Industrial Software you can tap the full engineering workflow potential.

- Fewer interfaces thanks to the integrated engineering environment for logic modules, HMI, motion control and process technology.
- Fast implementation of the process design in the automation structure thanks to system-wide engineering from a central control point.
- Shorter design and implementation times thanks to structured, process-oriented programming methodology.
- Reduced overhead for follow-up projects thanks to modules that can be easily re-used.
- Less overhead for entering data and no inconsistencies thanks to a shared database.
- Less overhead thanks to user-friendly configuring instead of programming.
- Shorter training periods for the programming and maintenance personnel thanks to intuitive operation and the use of standard languages.
- Application software can be transferred thanks to the shared engineering environment for PLC- and PC-based solutions.
- Increased plant availability thanks to efficient process diagnostics.

### Standard Tools

- STEP 7, the basic engineering platform for all SIMATIC Controllers.
- STEP 7 Professional, the comprehensive Engineering Suite for all SIMATIC Controllers.
- STEP 7 Lite, the low-cost, entry-level software.



### Engineering Tools

- SIMATIC iMap, software for Component based Automation.
- S7-HiGraph, state diagrams.
- CFC, function charts.
- Distributed Safety Software, configuring of failsafe applications
- DOCPRO, generation of plant documentation.
- S7-PDIAG, process diagnostics.
- TeleService, remote maintenance and remote interfacing.
- D7-SYS, configuring of closed-loop control tasks.

Further information can be found at:

<http://www.siemens.com/simatic-software>

# Introduction

## SIMATIC PC-based Control and Embedded Control

WinAC –  
The SIMATIC S7  
in the PC

### PC-based Control

SIMATIC WinAC supplements SIMATIC S7 with PC-based controls. It is used when different tasks, such as data processing, communication, visualization and technology, are to be integrated on one PC.

SIMATIC WinAC is available in two basic versions:

- **SIMATIC WinAC Software PLCs** for tasks that require high flexibility and openness.
- **SIMATIC WinAC Slot PLCs** if the focus is on PC-independent operation, availability and high operational reliability.

With the open and powerful interfaces, SIMATIC WinAC is the ideal **platform for tailor-made automation solutions**.

SIMATIC WinAC hardware and software can be used on SIMATIC PCs and most commercially available PCs with the Professional versions of Windows 2000/XP.

SIMATIC WinAC can be easily combined with components from other manufacturers and can be integrated into the Office world over the standard interface OPC (OLE for Process Control).

Furthermore, SIMATIC WinAC permits easy horizontal integration of technological applications. For this purpose, the ODK (Open Development Kit) permits the integration of C++ programs into the WinAC control program and thus access to all hardware and software components of the PC.

Programming of WinAC is implemented with the standard SIMATIC programming tools - with STEP 7 or, if required, with the tried and tested engineering tools. SIMATIC WinAC is code-compatible with SIMATIC S7-400, i.e. program sections generated for SIMATIC S7-300 and S7-400 can continue to be used in WinAC and vice versa.

SIMATIC WinCC and ProTool/Pro can be connected via a SIMATIC interface to be able to use the comprehensive diagnostics functionality and the shared database, for example. The PG/OP communication permits the connection of SIMATIC programming devices and operator panels.



### Embedded Control

With WinAC Embedded Control, a new class of devices for control and visualization at the machine level on one platform is added to the SIMATIC product range.

**SIMATIC WinAC MP** is the soft PLC under Windows CE and runs on the MP370 multi-functional platform. WinAC MP is the most economical solution for deterministic processes in connection with a rugged hardware platform. It is also ideal for data-intensive tasks.

The SIMATIC MP370 provides the cost-optimized, rugged hardware platform and the visualization software for this purpose. The operator panels and programmable logic controllers are designed without a hard disk and fan and are thus real-time capable and deterministic.

Further information can be found at:

<http://www.PCbasedAutomation.de>



# Introduction SIMATIC DP

The fast  
fieldbus as  
system bus

## Distributed I/O

Decentralized structures are widely accepted because they are more flexible, easier, and many times more cost-effective. In this context, an integrated concept has been implemented with SIMATIC in connection with the PROFIBUS fieldbus which permits extremely high system performance.

Furthermore, PROFIBUS offers trend-setting innovations:

- PROFI-safe for transmitting safety-relevant signals over the fieldbus
- With PROFIdrive for Motion Control, the fieldbus becomes a drive bus as well
- PROFINET - the innovative and open Industrial Ethernet standard for industrial automation from the field level right up to the management level.

The system is **integrated**: SSIMATIC does not differentiate any longer between centralized and distributed I/O. One software package suffices for implementing hardware configuration, parameterization, tests, commissioning and documentation of all components. You can program and diagnose online from any location in the plant. Drives are also perfectly integrated into this concept.

The system is **powerful**: The interfaces have been integrated into a number of controller CPUs. This type of connection avoids the execution times at the interface and the backplane bus and saves space and costs while retaining full performance and speed.

I/O devices with distributed intelligence accept CPU tasks on site and off-load the central control even more.

In addition to I/O devices with distributed intelligence, drives communicate as slaves over PROFIBUS DP.

The Drive Engineering System (Drive ES) is totally integrated in the SIMATIC Manager and permits easy and fast integration of drives in the SIMATIC environment.

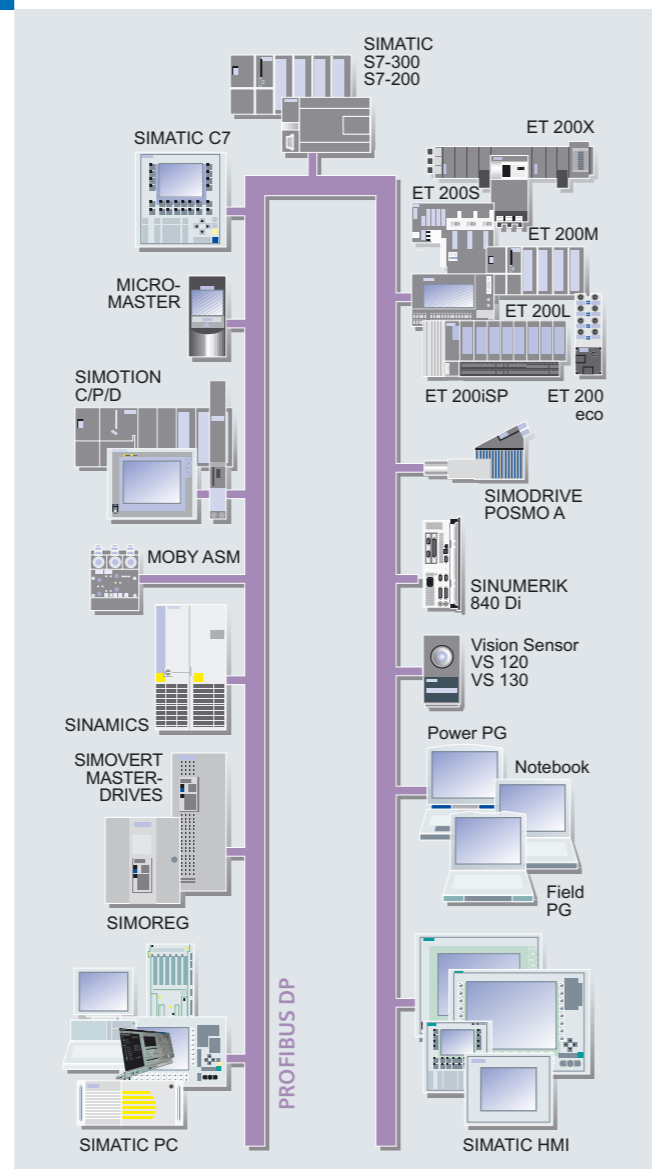
Thanks to the new functions of PROFIBUS DP - operation in isochrone mode for open-loop control and synchronization of drives via the bus, and internode communication for direct communication between drives and I/O - Motion Control tasks can be implemented on different hardware platforms (e.g. PC, PLC, or drive).

Different converter series are available depending on the drive task:

- SIMOTION C/P/D
- SINAMICS
- MICROMASTER/COMBIMASTER
- SIMODRIVE 611 universal
- SIMODRIVE POSMO
- Intelligent drives SIMOVERT MASTERDRIVES

The System is **flexible**:

Additional bus systems can be connected using couplers, e.g. the binary networking system AS-Interface, the bus system PROFIBUS PA for applications in hazardous areas or, of course, Industrial Ethernet/PROFINET.



A comprehensive range of distributed I/O devices is available. SIMATIC ET 200 can offer the right device for any application:

- ET 200M, ET 200S, ET 200L for the control cabinet with IP20 degree of protection.
- ET 200iSP for hazardous areas (IP30)
- ET 200X. ET 200R, ET 200eco for cabinet-less distributed configurations with IP65/67 degree of protection.
- ET 200 also integrate pneumatic connection, CPU performances, technology functions, motor starters, frequency converters, or even safety technology.

Further information can be found at:

<http://www.siemens.com/simatic-dp>



# Introduction SIMATIC HMI

Maintaining the  
overview easily

To maintain the overview, operator control and monitoring systems are becoming increasingly important - also in the lower performance range.

In this context SIMATIC is relying heavily, within the framework of Totally Integrated Automation, on the SIMATIC HMI system family - from Panels over PC-based single-user systems right up to networked Client-Server structures.

The HMI systems request the process data required for their configured sequence diagrams from the SIMATIC controller. The transfer is then implemented fully automatically and does not need to be included in the user program.

The configuration of the operator panels **at machine level** from the smallest Micro Panel to the PC, is executed with **WinCC flexible** (or ProTool). WinCC flexible considerably increases the efficiency of configuration in this case.

WinCC flexible is based on the latest software technologies and supports the project engineer with its user-friendly operator interface, libraries with pre-generated objects and picture blocks and intelligent tools. Text export/import and automatic translation permit the generation of multi-language configurations.

Additional options permit that new innovative automation concepts and additional service and maintenance functions are added to the application range of the SIMATIC operator panels and PC-based single-user systems.

TCP/IP communication permits that each operator panel can access the other to obtain variables and pictures. Thus operator panels with plant-wide access to process values and pictures, distributed operator panels on large, geographically separated machines, or simple local control station solutions can be implemented.

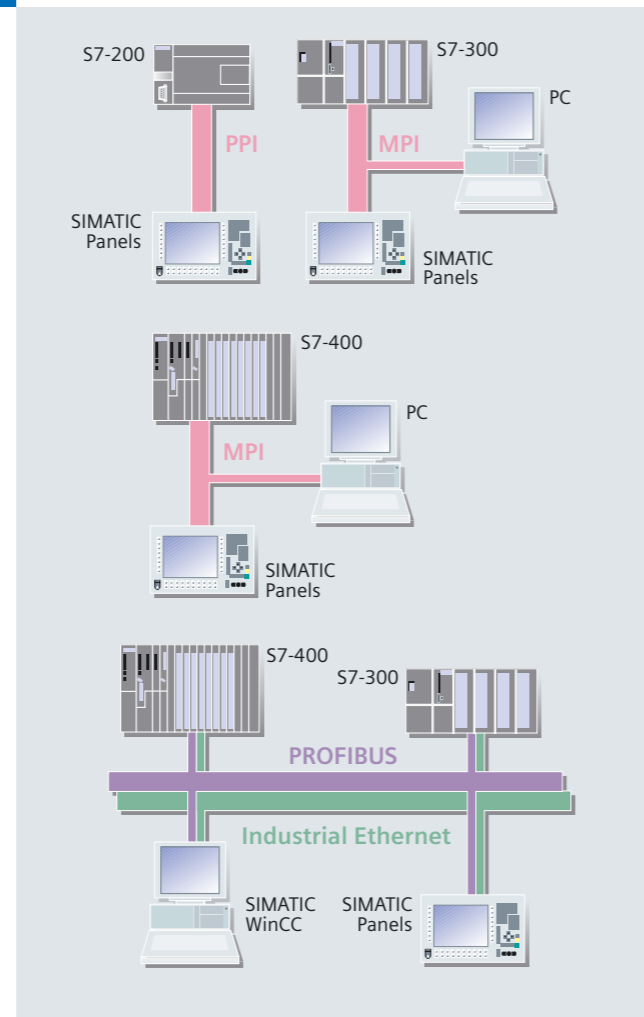
Event-triggered forwarding of emails, diagnostic functions, remote operation of local control stations over the intranet/Internet, as well as service and maintenance functions accelerate the entire process sequence from the disturbance to fault clearance.

Existing ProTool projects can be integrated or converted without a problem and ensure continued investment protection of prior engineering services.

The Runtime software **WinCC flexible Runtime** is used for PC-based single-user solutions at the machine level under Windows 2000/XP. It includes the visualization and signaling components and can be expanded as required using option packages.

**SIMATIC WinCC** from the SIMATIC HMI product range is available as PC-based process visualization system.

SIMATIC WinCC can be used as single-user system or in networked Client-Server configurations as multi-user system under Windows 2000/XP. Software packages, graded according to the number of variables, and option packages



offer individual connection options in case of increasing quantity structures and functional expansions.

Archive data are stored in a relational database (MS SQL Server 2000) and can be read from there, e.g. over OLE-DB.

Applications executing parallel with WinCC, e.g. MS Excel, can request process data via open standard interfaces.

Furthermore, commercially available OCX (OLE Custom Controls) can be integrated.

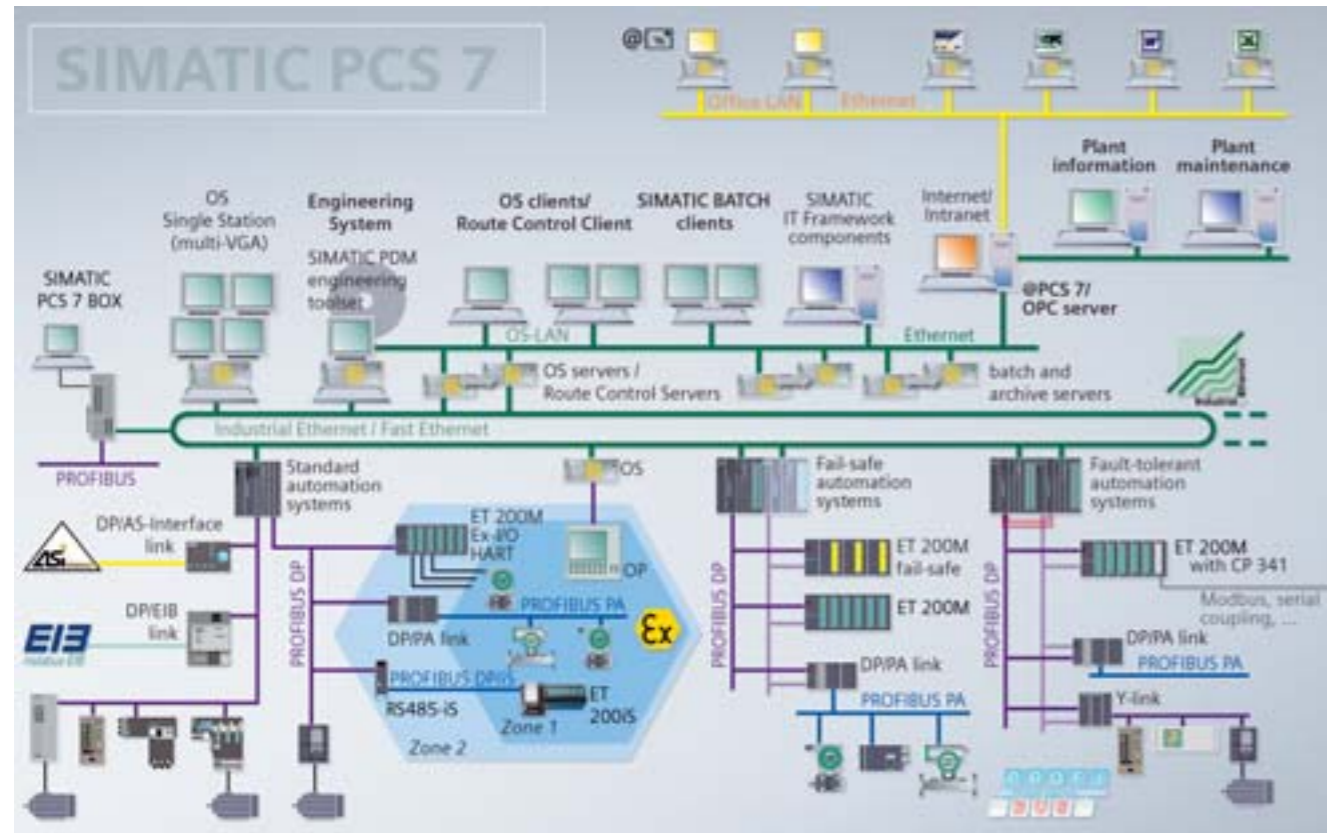
Thanks to the Windows-compliant operator interface, fast and easy configuring is possible, e.g. integration of existing standard and application programs. Online configuring permits modifications on site without interrupting the ongoing operator control and monitoring process.

Further information can be found at:

<http://www.siemens.com/simatichmi>

# Introduction

## SIMATIC PCS 7



### SIMATIC PCS 7 – The process control system from Totally Integrated Automation

With Totally Integrated Automation (TIA), Siemens offers integrated automation technology for the entire process sequence based on one single platform, from incoming goods to production and primary processes and downstream processes (secondary processes) all the way to outgoing goods. This integrated automation technology has the purpose of optimizing all operating procedures within a company, from the Enterprise Resource Planning (ERP) level over the Management Execution System (MES) level and Control level right down to the field level.

#### Horizontal integration

Horizontal integration means that uniform standard hardware and software components from the SIMATIC product range are used for the entire production process - from incoming goods to primary processes and downstream processes (secondary processes) all the way to outgoing goods.

As the process control system in the enterprise-wide automation network Totally Integrated Automation, SIMATIC PCS 7 utilizes selected standard hardware and software components from the TIA modular system. With its integrated data management, communication and configuration, it also provides an open platform for modern, future-oriented and economic automation solutions in all sectors of the process industry, manufacturing industry and hybrid industry (combination of continuous/batch processes and discrete manufacturing, e.g. in the glass or pharmaceutical industries).

While secondary and logistics processes in the process and hybrid industry are frequently automated by Motion Control and SIMATIC components, the SIMATIC PCS 7 process control system takes over when it comes to primary processes.

In the TIA network, SIMATIC PCS 7 does not only handle the usual process control tasks, but it can also automate secondary processes (e.g. filling, packaging) or incoming goods and outgoing goods logistics (e.g. material supply, storage) for a production site.

The process control system  
for all automation applications

#### Vertical integration

A characteristic of vertical integration is the integrated and transparent data communication from the ERP level over the MES level and control level right down to the field level. It is characterized by the increasing amalgamation of automation technology and information technology and their standards in the course of establishing company-wide information networks. This permits the modularization and standardization of entire subprocesses and thus a considerable increase in production flexibility.

The vertical integration of SIMATIC PCS 7 into the company environment comprises two aspects:

- Integration into the company-wide information network and
- Integration of field technology.

By linking the automation level with the IT world, process data are made available company-wide for evaluation, planning, coordination, and optimization of operating procedures as well as production and business processes. At the same time the requirements of international and distributed companies are considered.

SIMATIC PCS 7 relies on PROFIBUS technology for integrating distributed field systems. The PROFIBUS is simple, rugged and reliable and is used worldwide in all sectors of the process, manufacturing and hybrid industry - for incoming and outgoing goods logistics as well as for primary and secondary processes. It supports redundancy and fail-safety as well as online extendibility and can be used in standard environments as well as in hazardous areas, whereby it does not matter whether the plant is equipped with classical signal inputs and outputs at the remote I/O ET 200 or with the state-of-the-art field devices.

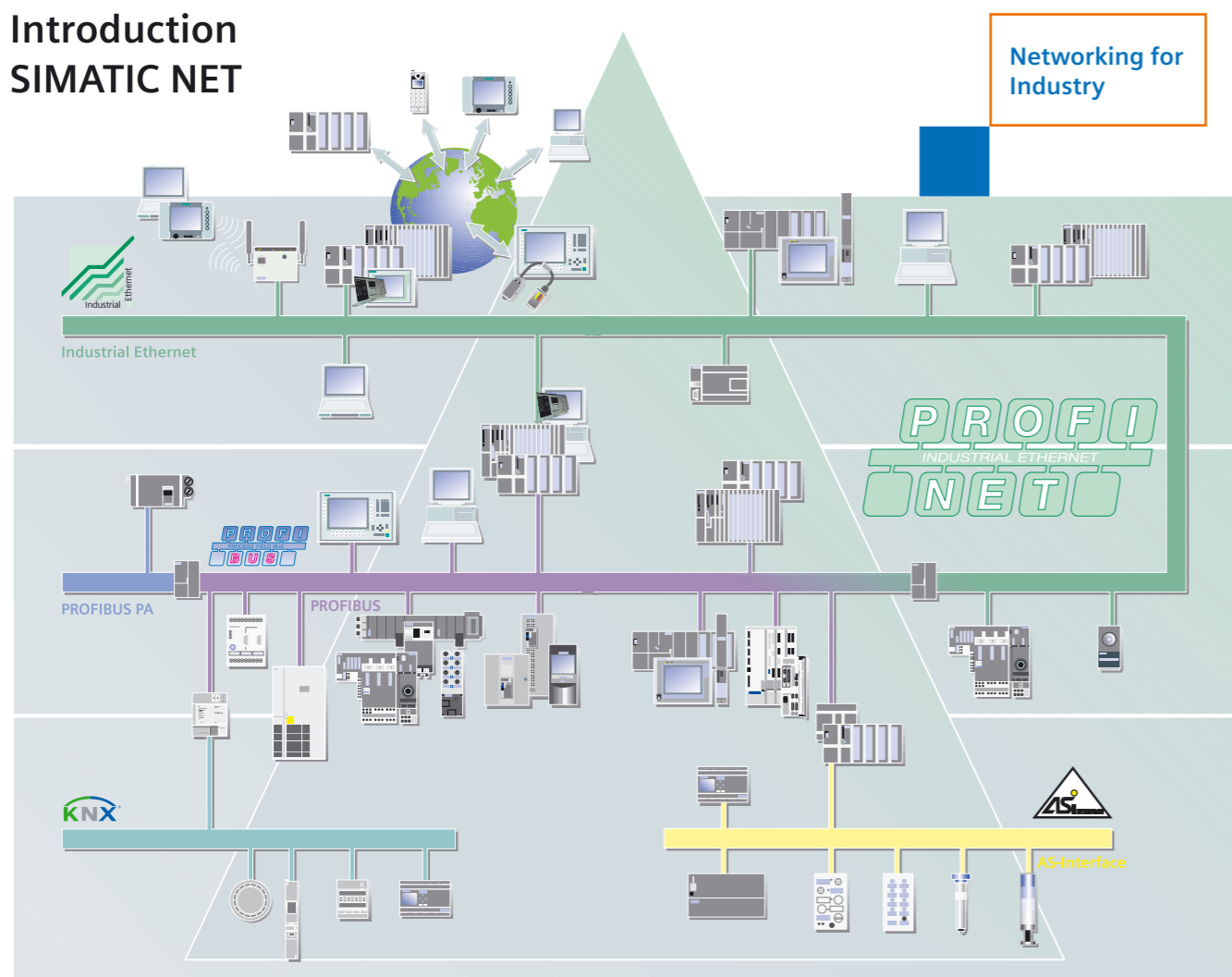
Further information can be found at:

<http://www.siemens.com/simatic-pcs7>

and in the ST PCS 7 Catalog.



# Introduction SIMATIC NET



## Communication

Communications networks are an important component of automation solutions. SIMATIC NET Networking for Industry offers a wide range of modular components - designed for industry - to solve your communications tasks efficiently:

- For the different automation tasks
- Throughout the entire workflow.
- Throughout the plant's entire life cycle.
- For all sectors.

SIMATIC NET offers solutions that not only utilize the benefits of Ethernet, but also easily integrate fieldbus systems.

Some prominent examples are:

- Making the field level available for Industrial Ethernet applications.
- Uniformity from the field level right up to the corporate management level.
- Pushing ahead with mobile communication.
- Integration of IT technologies.

SIMATIC NET supports the following bus systems:

**Industrial Ethernet** (IEEE 802.3 and 802.11) – today the international standard for area networking is the global No. 1 network in the LAN sector with a share of over 80 %.

High-performance communications networks spanning large distances can be created over Industrial Ethernet.

The international **PROFINET** standard uses Industrial Ethernet and permits real-time communication down to the field level. If existing IT standards are completely utilized, PROFINET also permits Motion Control applications on Industrial Ethernet in isochrone mode.

**PROFIBUS** (IEC 61158/EN 50170) – the international standard for the field level is the global market leader in the fieldbus area. As only fieldbus it permits communication both in production- and process-oriented applications.

**AS-Interface** (IEC 62026-2/EN 50295) – as low-cost alternative to the cable harness, AS-Interface links sensors and actuators over a two-wire line.

**KNX** (EN 50090, ANSI EIA 776) – the global standard KNX is the basis for building automation. Network transitions are implemented via controls or links.

Further information can be found at:

<http://www.siemens.com/simatic-net>



|             |                                       |
|-------------|---------------------------------------|
| <b>2/2</b>  | <b>Introduction</b>                   |
| 2/2         | LOGO! logic module                    |
| <b>2/3</b>  | <b>LOGO! modular</b>                  |
| 2/3         | LOGO! modular basic variants          |
| 2/5         | LOGO! modular pure variants           |
| 2/7         | LOGO! modular expansion modules       |
| 2/10        | LOGO! CM EIB/KNX communication module |
| 2/11        | AS-Interface connection for LOGO!     |
| <b>2/12</b> | <b>LOGO!Power</b>                     |
| 2/12        | LOGO!Power 12 V                       |
| 2/14        | LOGO!Power 24 V                       |
| <b>2/16</b> | <b>LOGO!Contact</b>                   |
| <b>2/17</b> | <b>LOGO! Software</b>                 |





Overview



**LOGO! logic module**

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 34 different functions can be linked by pressing a key or with PC software; up to a total of 130 times
- Functions can be changed easily at the touch of a button. No need for complex and time-consuming rewiring

**SIPLUS LOGO! logic module**

- The PLC for use in the harshest environmental conditions
- With extended temperature range from -25 to +70°C
- Suitable for extraordinary medial load (pollution gas atmosphere)
- Occasional short-term condensation and increased mechanical loading permissible
- With the proven PLC technology of the S7-200
- Convenient handling, programming, maintenance and service
- Ideal for use in the automotive industry, environmental technology, mining, chemical plants, production technology, food industry etc.
- The alternative to expensive custom solutions

More Information you can find at:

<http://www.siemens.com/siplus>

**General technical specifications SIPLUS LOGO!**

| Ambient temperature                 |   |
|-------------------------------------|---|
| Temperature                         | Horizontal mounting:<br>-25 °C to 70 °C<br>Vertical mounting:<br>-25 °C to 50 °C  |
| Relative humidity                   | 5 to 95%;<br>transient condensation permissible, corresponding to relative humidity (RH-) stress grade 2 according to IEC 1131-2 and IEC 721 3-3 Cl. 3K5  |
| Transient icing                     | -25 °C to 0 °C IEC 721 3-3 Cl. 3K5  |
| Atmospheric pressure                | 1080 to 795 hPa corresponding to a height of -1000 to 2000 m  |
| Pollutant concentration             | SO2: < 0,5 ppm; relative humidity <60% Test: 10 ppm, 4 days<br>H2S: < 0,1 ppm; relative humidity <60% Test: 1 ppm, 4 days (according to IEC 721 3-3; Class 3C3)   |
| Mechanical environmental conditions |   |
| Vibrations                          | Type of vibration: frequency progressions changing at 1 octave per minute.<br>2 Hz ≤ f ≤ 9 Hz, constant amplitude 3,0 mm 9 Hz ≤ f ≤ 150 Hz, constant acceleration 1 g; Duration of vibration: 10 frequency progressions per axis in each direction of the three mutually perpendicular axes; Vibration testing according to IEC 68 section 2-6 (Sinus) and IEC 721 3-3, Class 3M4 |
| Shock                               | Type of shock: semisinusoidal shock strength: 15 g peak value, duration shock direction 11 ms: 3 shocks each in +/- direction on each of the mutually perpendicular axes<br>Shock testing according to IEC 68 section 2-27  |
| Conformity                          | EN 50155 (railroad applications - electronic device on rail vehicles)   |



Overview



- The space-saving basic versions
- With interface for connection of expansion modules

Technical specifications

|  | 6ED1 052-1CC00-0BA4                          | 6ED1 052-1MD00-0BA4                          | 6ED1 052-1HB00-0BA4          | 6ED1 052-1FB00-0BA4          |
|--|--|--|------------------------------|------------------------------|
| <b>Supply voltages</b>   |  |  |                              |                              |
| Rated value  |  | Yes  |                              |                              |
| - 12 V DC  | Yes  | Yes  | Yes                          |                              |
| - 24 V DC  |  |  |                              |                              |
| - 115 V DC   |  |  |                              | Yes                          |
| - 230 V DC   |  |  |                              | Yes                          |
| - permissible range, lower limit (DC)                                    | 20.4 V                                       | 10.8 V                                       | 20.4 V                       | 100 V                        |
| - permissible range, upper limit (DC)                                    | 28.8 V                                       | 28.8 V                                       | 28.8 V                       | 253 V                        |
| - 115 V AC   |  |  |                              | Yes                          |
| - 230 V AC   |  |  |                              | Yes                          |
| - permissible range, lower limit (AC)                                    |  |  | 20.4 V                       | 85 V                         |
| - permissible range, upper limit (AC)                                    |  |  | 26.4 V                       | 265 V                        |
| <b>Time</b>  |  |  |                              |                              |
| Time switches  |  |  |                              |                              |
| - Reserve power  |  | 80 h   | 80 h                         | 80 h                         |
| •Number of digital inputs  | 8; of which 2 can be for analog use (0..10V) | 8; of which 2 can be for analog use (0..10V) | 8                            | 8                            |
| <b>Digital outputs</b>   |  |  |                              |                              |
| •Number of digital outputs   | 4; Transistor                                | 4; Relay                                     | 4; Relay                     | 4; Relay                     |
| •Short-circuit protection of the output                                  | Yes; electric (1 A)                          | No; external fusing required                 | No; external fusing required | No; external fusing required |
| <b>Relay outputs</b>   |  |  |                              |                              |
| Switching capacity of the contacts                                       |  |  |                              |                              |
| - at inductive load, max.  |  | 3 A  | 3 A                          | 3 A                          |
| - at resistive load, max.  | 0.3 A  | 10 A   | 10 A                         | 10 A                         |
| <b>EMC</b>   |  |  |                              |                              |
| •Emission of radio interference to comply with EN 55 011 (limit class B) | Yes  | Yes  | Yes                          | Yes                          |
| <b>Environmental requirements</b>  |  |  |                              |                              |
| Operating temperature  |  |  |                              |                              |
| - min.   | 0 °C   | 0 °C   | 0 °C                         | 0 °C                         |
| - max.   | 55 °C  | 55 °C  | 55 °C                        | 55 °C                        |
| Degree of protection and class of protection                             |  |  |                              |                              |
| - IP 20  | Yes  | Yes  | Yes                          | Yes                          |

Technical specifications (Continued)

|  | 6ED1 052-1CC00-0BA4                 | 6ED1 052-1MD00-0BA4                 | 6ED1 052-1HB00-0BA4                 | 6ED1 052-1FB00-0BA4                 |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <b>Standards, approvals, certification</b> |                                     |                                     |                                     |                                     |
| •CSA approval                              | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •Developed to comply with IEC1131          | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •FM approval                               | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •To comply with VDE 0631                   | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •Shipbuilding approval                     | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •UL approval                               | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| <b>Dimensions and weight</b>               |                                     |                                     |                                     |                                     |
| •Installation                              | on 35 mm DIN rail<br>4 modules wide | on 35 mm DIN rail<br>4 modules wide | on 35 mm DIN rail<br>4 modules wide | on 35 mm DIN rail<br>4 modules wide |
| •Width                                     | 72 mm                               | 72 mm                               | 72 mm                               | 72 mm                               |
| •Height                                    | 90 mm                               | 90 mm                               | 90 mm                               | 90 mm                               |
| •Depth                                     | 55 mm                               | 55 mm                               | 55 mm                               | 55 mm                               |

Ordering Data

| Ordering Data   | Order No.                  | Ordering Data  | Order No.  |
|---|----------------------------|--|--|
| <b>LOGO! 24</b><br>Power supply 24 V DC, 8 digital inputs 24 V DC, of which 2 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A; 130 function blocks connectable, expandable by modular system                                   | <b>6ED1 052-1CC00-0BA4</b> | <b>Accessories</b>   |  |
| <b>LOGO! 12/24RC logic module</b><br>Power supply 12/24 V DC, 8 digital inputs 12/24 V DC, of which 2 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integral time switch; 130 function blocks connectable, expandable by modular system | <b>6ED1 052-1MD00-0BA4</b> | <b>LOGO! Manual</b><br>German<br>English<br>French<br>spanisch<br>italienisch  | <b>6ED1 050-1AA00-0AE5</b><br><b>6ED1 050-1AA00-0BE5</b><br><b>6ED1 050-1AA00-0CE5</b><br><b>6ED1 050-1AA00-0DE5</b><br><b>6ED1 050-1AA00-0EE5</b> |
| <b>LOGO! 24RC logic module</b><br>Power supply 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integral time switch; 130 function blocks connectable, expandable by modular system   | <b>6ED1 052-1HB00-0BA4</b> | <b>LOGO! Memory card</b><br>for copying, with know-how protection  | <b>6ED1 056-5CA00-0BA0</b>   |
| <b>LOGO! 230RC logic module</b><br>Power supply 115/230 V AC/DC, 8 digital inputs 115/230 V AC/DC, 4 relay outputs 10 A, integral time switch; 130 function blocks connectable, expandable by modular system  | <b>6ED1 052-1FB00-0BA4</b> | <b>LOGO!Soft Comfort V4.0</b> <sup>B)</sup><br>for programming on the PC in LAD/FBD; executes with Windows 95 onwards, Linux, MAC OSX; on CD-ROM   | <b>6ED1 058-0BA00-0YA0</b>   |
|   |                            | <b>LOGO!Soft Comfort Upgrade</b> <sup>B)</sup><br>V1.0 upwards to V4.0   | <b>6ED1 058-0CA00-0YE0</b>   |
|   |                            | <b>LOGO! PC cable</b><br>for program transmission between LOGO! and PC   | <b>6ED1 057-1AA00-0BA0</b>   |
|   |                            | <b>LOGO! News Box, 12/24 V</b><br>contains LOGO! 12/24RC, LOGO! PC cable, LOGO!Soft Comfort, Tips&Tricks manual, screwdriver, info material<br>German <sup>C)</sup><br>English <sup>C)</sup> | <b>6ED1 057-3BA00-0AA3</b><br><b>6ED1 057-3BA00-0BA3</b>   |
|   |                            | <b>LOGO! News Box, 230 V</b><br>contains LOGO! 230RC, LOGO! PC cable, LOGO!Soft Comfort, Tips&Tricks manual, screwdriver, info material<br>German <sup>C)</sup><br>English <sup>C)</sup>     | <b>6ED1 057-3AA00-0AA8</b><br><b>6ED1 057-3AA00-0BA8</b>   |

B) Subject to export regulations: AL: N and ECCN: EAR99S

C) Subject to export regulations: AL: N and ECCN: EAR99T

Overview



- The basic versions at optimum cost
- With integrated interface for the connection of expansion modules

Technical specifications

|  | 6ED1 052-2CC00-0BA4                          | 6ED1 052-2MD00-0BA4                          | 6ED1 052-2HB00-0BA4          | 6ED1 052-2FB00-0BA4          |
|--|--|--|------------------------------|------------------------------|
| <b>Supply voltages</b>   |  |  |                              |                              |
| Rated value  |  |  |                              |                              |
| - 12 V DC  |  | Yes  |                              |                              |
| - 24 V DC  | Yes  | Yes  |                              |                              |
| - 115 V DC   |  |  |                              | Yes                          |
| - 230 V DC   |  |  |                              | Yes                          |
| - permissible range, lower limit (DC)                                    | 20.4 V                                       | 10.8 V                                       | 20.4 V                       | 100 V                        |
| - permissible range, upper limit (DC)                                    | 28.8 V                                       | 28.8 V                                       | 28.8 V                       | 253 V                        |
| - 115 V AC   |  |  |                              | Yes                          |
| - 230 V AC   |  |  |                              | Yes                          |
| - permissible range, lower limit (AC)                                    |  |  | 20.4 V                       | 85 V                         |
| - permissible range, upper limit (AC)                                    |  |  | 26.4 V                       | 265 V                        |
| <b>Time</b>  |  |  |                              |                              |
| Time switches  |  |  |                              |                              |
| - Number   |  | 8  | 8                            | 8                            |
| - Reserve power  |  | 80 h   | 80 h                         | 80 h                         |
| •Number of digital inputs  | 8; of which 2 can be for analog use (0..10V) | 8; of which 2 can be for analog use (0..10V) | 8                            | 8                            |
| <b>Digital outputs</b>   |  |  |                              |                              |
| •Number of digital outputs   | 4; Transistor                                | 4; Relay                                     | 4; Relay                     | 4; Relay                     |
| •Short-circuit protection of the output                                  | Yes; electric (1 A)                          | No; external fusing required                 | No; external fusing required | No; external fusing required |
| <b>Relay outputs</b>   |  |  |                              |                              |
| Switching capacity of the contacts                                       |  |  |                              |                              |
| - at inductive load, max.  |  | 3 A  | 3 A                          | 3 A                          |
| - at resistive load, max.  | 0.3 A  | 10 A   | 10 A                         | 10 A                         |
| <b>EMC</b>   |  |  |                              |                              |
| •Emission of radio interference to comply with EN 55 011 (limit class B) |  | Yes  | Yes                          | Yes                          |
| <b>Environmental requirements</b>  |  |  |                              |                              |
| Operating temperature  |  |  |                              |                              |
| - min.   | 0 °C   | 0 °C   | 0 °C                         | 0 °C                         |
| - max.   | 55 °C  | 55 °C  | 55 °C                        | 55 °C                        |
| Degree of protection and class of protection                             |  |  |                              |                              |
| - IP 20  | Yes  | Yes  | Yes                          | Yes                          |

Technical specifications (Continued)

|  | 6ED1 052-2CC00-0BA4                 | 6ED1 052-2MD00-0BA4                 | 6ED1 052-2HB00-0BA4                 | 6ED1 052-2FB00-0BA4                 |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <b>Standards, approvals, certification</b> |                                     |                                     |                                     |                                     |
| •CSA approval                              | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •Developed to comply with IEC1131          | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •FM approval                               | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •To comply with VDE 0631                   | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •Shipbuilding approval                     | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| •UL approval                               | Yes                                 | Yes                                 | Yes                                 | Yes                                 |
| <b>Dimensions and weight</b>               |                                     |                                     |                                     |                                     |
| •Installation                              | on 35 mm DIN rail<br>4 modules wide | on 35 mm DIN rail<br>4 modules wide | on 35 mm DIN rail<br>4 modules wide | on 35 mm DIN rail<br>4 modules wide |
| •Width                                     | 72 mm                               | 72 mm                               | 72 mm                               | 72 mm                               |
| •Height                                    | 90 mm                               | 90 mm                               | 90 mm                               | 90 mm                               |
| •Depth                                     | 55 mm                               | 55 mm                               | 55 mm                               | 55 mm                               |

Ordering Data

|  | Order No.                  |   | Order No.  |
|--|----------------------------|---|--|
| <b>LOGO! 24o logic module</b><br>Power supply 24 V DC,<br>8 digital inputs 24 V DC, of which<br>2 can be used in analog mode (0<br>to 10 V),<br>4 digital outputs 24 V DC, 0.3 A;<br>without display and keyboard;<br>130 function blocks connectable,<br>expandable by modular system                         | <b>6ED1 052-2CC00-0BA4</b> | <b>Accessories</b>  |  |
| <b>LOGO! 12/24RCo logic module</b><br>Power supply 12/24 V DC,<br>8 digital inputs 12/24 V DC, of<br>which 2 can be used in analog<br>mode (0 to 10 V),<br>4 relay outputs 10 A,<br>integral time switch;<br>without display and keyboard;<br>130 function blocks connectable,<br>expandable by modular system | <b>6ED1 052-2MD00-0BA4</b> | <b>LOGO! Manual</b><br>German<br>English<br>French<br>Spanish<br>Italian  | <b>6ED1 050-1AA00-0AE5</b><br><b>6ED1 050-1AA00-0BE5</b><br><b>6ED1 050-1AA00-0CE5</b><br><b>6ED1 050-1AA00-0DE5</b><br><b>6ED1 050-1AA00-0EE5</b> |
| <b>LOGO! 24RCo logic module</b><br>Power supply 24 V AC/DC,<br>8 digital inputs 24 V AC/DC,<br>4 relay outputs 10 A,<br>integral time switch;<br>without display and keyboard;<br>130 function blocks connectable,<br>expandable by modular system   | <b>6ED1 052-2HB00-0BA4</b> | <b>LOGO! Memory Card</b><br>for copying, with know-how pro-<br>tection  | <b>6ED1 056-5CA00-0BA0</b>   |
| <b>LOGO! 230RCo logic module</b><br>Power supply 115/230 V AC/DC,<br>8 digital inputs 115/230 V AC/DC,<br>4 relay outputs 10 A,<br>integral time switch;<br>without display and keyboard;<br>130 function blocks connectable,<br>expandable by modular system  | <b>6ED1 052-2FB00-0BA4</b> | <b>LOGO!Soft Comfort V4.0</b> <sup>B)</sup><br>for programming on the PC in<br>LAD/FBD; executes with<br>Windows 95 onwards, Linux,<br>MAC OSX; on CD-ROM   | <b>6ED1 058-0BA00-0YA0</b>   |
|  |                            | <b>LOGO!Soft Comfort Upgrade</b> <sup>B)</sup><br>V1.0 upwards to V4.0  | <b>6ED1 058-0CA00-0YE0</b>   |
|  |                            | <b>LOGO! PC cable</b><br>for program transmission<br>between LOGO! and PC   | <b>6ED1 057-1AA00-0BA0</b>   |
|  |                            | <b>LOGO! News Box, 12/24 V</b><br>contains LOGO! 12/24RC,<br>LOGO! PC cable, LOGO!Soft<br>Comfort, Tips&Tricks manual,<br>screwdriver, info material<br>German <sup>C)</sup><br>English <sup>C)</sup> | <b>6ED1 057-3BA00-0AA3</b><br><b>6ED1 057-3BA00-0BA3</b>   |
|  |                            | <b>LOGO! News Box, 230 V</b><br>contains LOGO! 230RC, LOGO!<br>PC cable, LOGO!Soft Comfort,<br>Tips&Tricks manual, screwdriver,<br>info material<br>German <sup>C)</sup><br>English <sup>C)</sup>     | <b>6ED1 057-3AA00-0AA8</b><br><b>6ED1 057-3AA00-0BA8</b>   |

B) Subject to export regulations: AL: N and ECCN: EAR99S

C) Subject to export regulations: AL: N and ECCN: EAR99T

Overview



- Expansion modules for the connection to LOGO! semi-modular
- With digital inputs and outputs or analog inputs

Technical specifications

|  | 6ED1 055-1CB00-0BA0 | 6ED1 055-1HB00-0BA0          | 6ED1 055-1MB00-0BA1          | 6ED1 055-1FB00-0BA1          |
|--|---------------------|------------------------------|------------------------------|------------------------------|
| <b>Supply voltages</b>   |                     |                              |                              |                              |
| Rated value  |                     |                              | Yes                          |                              |
| - 12 V DC  | Yes                 | Yes                          | Yes                          |                              |
| - 24 V DC  |                     |                              | Yes                          |                              |
| - 115 V DC   |                     |                              |                              | Yes                          |
| - 230 V DC   |                     |                              |                              | Yes                          |
| - permissible range, lower limit (DC)                                    | 20.4 V              | 20.4 V                       | 10.8 V                       | 100 V                        |
| - permissible range, upper limit (DC)                                    | 28.8 V              | 28.8 V                       | 28.8 V                       | 253 V                        |
| - 115 V AC   |                     |                              |                              | Yes                          |
| - 230 V AC   |                     |                              |                              | Yes                          |
| - permissible range, lower limit (AC)                                    |                     | 20.4 V                       |                              | 85 V                         |
| - permissible range, upper limit (AC)                                    |                     | 26.4 V                       |                              | 265 V                        |
| <b>Digital inputs</b>  |                     |                              |                              |                              |
| •Number of digital inputs  | 4                   | 4                            | 4                            | 4                            |
| <b>Digital outputs</b>   |                     |                              |                              |                              |
| •Number of digital outputs   | 4                   | 4; Relay                     | 4; Relay                     | 4; Relay                     |
| •Short-circuit protection of the output                                  | Yes; electric (1 A) | No; external fusing required | No; external fusing required | No; external fusing required |
| <b>Relay outputs</b>   |                     |                              |                              |                              |
| Switching capacity of the contacts                                       |                     |                              |                              |                              |
| - at inductive load, max.  |                     | 3 A                          | 3 A                          | 3 A                          |
| - at resistive load, max.  |                     | 5 A                          | 5 A                          | 5 A                          |
| - Continuous thermal current, max.                                       | 0.3 A               |                              |                              |                              |
| <b>EMC</b>   |                     |                              |                              |                              |
| •Emission of radio interference to comply with EN 55 011 (limit class B) | Yes                 | Yes                          | Yes                          | Yes                          |
| <b>Environmental requirements</b>  |                     |                              |                              |                              |
| Operating temperature  |                     |                              |                              |                              |
| - min.   | 0 °C                | 0 °C                         | 0 °C                         | 0 °C                         |
| - max.   | 55 °C               | 55 °C                        | 55 °C                        | 55 °C                        |
| Degree of protection and class of protection                             |                     |                              |                              |                              |
| - IP 20  | Yes                 | Yes                          | Yes                          | Yes                          |

Technical specifications (Continued)

|  | 6ED1 055-1CB00-0BA0               | 6ED1 055-1HB00-0BA0               | 6ED1 055-1MB00-0BA1               | 6ED1 055-1FB00-0BA1               |
|--|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <b>Standards, approvals, certification</b> |                                   |                                   |                                   |                                   |
| •CSA approval                              | Yes                               | Yes                               | Yes                               | Yes                               |
| •Developed to comply with IEC1131          | Yes                               | Yes                               | Yes                               | Yes                               |
| •FM approval                               | Yes                               | Yes                               | Yes                               | Yes                               |
| •To comply with VDE 0631                   | Yes                               | Yes                               | Yes                               | Yes                               |
| •Shipbuilding approval                     | Yes                               | Yes                               | Yes                               | Yes                               |
| •UL approval                               | Yes                               | Yes                               | Yes                               | Yes                               |
| <b>Dimensions and weight</b>               |                                   |                                   |                                   |                                   |
| •Installation                              | on 35 mm DIN rail, 2 modules wide | on 35 mm DIN rail, 2 modules wide | on 35 mm DIN rail, 2 modules wide | on 35 mm DIN rail, 2 modules wide |
| •Width                                     | 36 mm; 2 TE                       | 36 mm; 2 TE                       | 36 mm; 2 TE                       | 36 mm; 2 TE                       |
| •Height                                    | 90 mm                             | 90 mm                             | 90 mm                             | 90 mm                             |
| •Depth                                     | 55 mm                             | 55 mm                             | 55 mm                             | 55 mm                             |

|  | 6ED1 055-1MA00-0BA0               | 6ED1 055-1MD00-0BA0               |
|--|-----------------------------------|-----------------------------------|
| <b>Supply voltages</b>   |                                   |                                   |
| Rated value  |                                   |                                   |
| - 12 V DC  | Yes                               | Yes                               |
| - 24 V DC  | Yes                               | Yes                               |
| <b>Analog inputs</b>   |                                   |                                   |
| •Number of analog inputs   | 2                                 | 2                                 |
| Input ranges (rated values), voltages                                    |                                   |                                   |
| - Voltage  | Yes                               |                                   |
| - 0 to +10 V   | Yes                               |                                   |
| Input ranges (rated values), currents                                    |                                   |                                   |
| - Current  | Yes                               |                                   |
| - 0 to 20 mA   | Yes                               |                                   |
| - Resistance thermometer   |                                   | Yes                               |
| - Pt 100   |                                   | Yes                               |
| <b>EMC</b>   |                                   |                                   |
| •Emission of radio interference to comply with EN 55 011 (limit class B) | Yes                               | Yes                               |
| <b>Environmental requirements</b>  |                                   |                                   |
| Operating temperature  |                                   |                                   |
| - min.   | 0 °C                              | 0 °C                              |
| - max.   | 55 °C                             | 55 °C                             |
| Degree of protection and class of protection                             |                                   |                                   |
| - IP 20  | Yes                               | Yes                               |
| <b>Standards, approvals, certification</b>                               |                                   |                                   |
| •CSA approval  | Yes                               | Yes                               |
| •Developed to comply with IEC1131  | Yes                               | Yes                               |
| •FM approval   | Yes                               | Yes                               |
| •To comply with VDE 0631   | Yes                               | Yes                               |
| •Shipbuilding approval   | Yes                               | Yes                               |
| •UL approval   | Yes                               | Yes                               |
| <b>Dimensions and weight</b>   |                                   |                                   |
| •Installation  | on 35 mm DIN rail, 2 modules wide | on 35 mm DIN rail, 2 modules wide |
| •Width   | 36 mm                             | 36 mm                             |
| •Height  | 90 mm                             | 90 mm                             |
| •Depth   | 55 mm                             | 55 mm                             |



| Ordering Data   | Order No.                  | Ordering Data   | Order No.                  |
|---|----------------------------|---|----------------------------|
| <b>LOGO! DM8 24</b><br>24 V DC supply voltage,<br>4 digital inputs 24 V DC, 4 digital<br>outputs 24 V DC, 0.3 A         | <b>6ED1 055-1CB00-0BA0</b> | <b>Accessories</b>  |                            |
| <b>LOGO! DM8 12/24R</b><br>12/24 V DC supply voltage,<br>4 digital inputs 12/24 V DC,<br>4 relay outputs 5 A            | <b>6ED1 055-1MB00-0BA1</b> | <b>LOGO! Manual</b>   |                            |
| <b>LOGO! DM8 24R</b><br>24 V AC/DC supply voltage,<br>4 digital inputs 24 V AC/DC, 4<br>relay outputs 5 A               | <b>6ED1 055-1HB00-0BA0</b> | German  | <b>6ED1 050-1AA00-0AE5</b> |
| <b>LOGO! DM8 230R</b><br>115/230 V AC/DC supply voltage,<br>4 digital inputs 115/230 V AC/DC,<br>4 relay outputs 5 A    | <b>6ED1 055-1FB00-0BA1</b> | English   | <b>6ED1 050-1AA00-0BE5</b> |
| <b>LOGO! DM16 24</b><br>24 V DC supply voltage,<br>8 digital inputs 24 V DC,<br>8 digital outputs 24 V DC, 0.3 A        | <b>6ED1 055-1CB10-0BA0</b> | French  | <b>6ED1 050-1AA00-0CE5</b> |
| <b>LOGO! DM16 24R</b><br>24 V DC supply voltage,<br>8 digital inputs 24 V DC,<br>8 relay outputs 5 A                    | <b>6ED1 055-1NB10-0BA0</b> | Spanish   | <b>6ED1 050-1AA00-0DE5</b> |
| <b>LOGO! DM16 230R</b><br>115/230 V AC/DC supply voltage,<br>8 digital inputs 115/230 V AC/DC,<br>8 relay outputs 5 A   | <b>6ED1 055-1FB10-0BA1</b> | Italian   | <b>6ED1 050-1AA00-0EE5</b> |
| <b>LOGO! AM2</b><br>12/24 V DC supply voltage,<br>2 analog inputs 0 to 10 V or 0 to<br>20 mA, 10-bit resolution         | <b>6ED1 055-1MA00-0BA0</b> | <b>LOGO! Memory Card</b>  | <b>6ED1 056-5CA00-0BA0</b> |
| <b>LOGO! AM2 PT 100</b><br>12/24 V DC supply voltage,<br>2 Pt100 analog inputs, tempera-<br>ture range -50 °C to 200 °C | <b>6ED1 055-1MD00-0BA0</b> | For copying, with know-how pro-<br>tection  |                            |
|   |                            | <b>LOGO!Soft Comfort V4.0</b> <sup>B)</sup>   | <b>6ED1 058-0BA00-0YA0</b> |
|   |                            | For programming on the PC in<br>LAD/FDP; executable on<br>Windows 95 and higher, Linux,<br>MAC OSX; on CD-ROM             |                            |
|   |                            | <b>LOGO!Soft Comfort Upgrade</b> <sup>B)</sup>  | <b>6ED1 058-0CA00-0YE0</b> |
|   |                            | from V1.0 to V4.0   |                            |
|   |                            | <b>LOGO! PC cable</b>   | <b>6ED1 057-1AA00-0BA0</b> |
|   |                            | For transferring programs bet-<br>ween LOGO! and the PC   |                            |
|   |                            | <b>LOGO! News Box, 12/24 V</b>  |                            |
|   |                            | Contains LOGO! 12/24RC,<br>LOGO! PC cable, LOGO!Soft<br>Comfort, Tips&Tricks manual,<br>screwdriver, information material |                            |
|   |                            | German <sup>C)</sup>  | <b>6ED1 057-3BA00-0AA3</b> |
|   |                            | English <sup>C)</sup>   | <b>6ED1 057-3BA00-0BA3</b> |
|   |                            | <b>LOGO! News Box, 230 V</b>  |                            |
|   |                            | Contains LOGO! 230RC, LOGO!<br>PC cable, LOGO!Soft Comfort,<br>Tips&Tricks manual, screwdriver,<br>information material   |                            |
|   |                            | German <sup>C)</sup>  | <b>6ED1 057-3AA00-0AA8</b> |
|   |                            | English <sup>C)</sup>   | <b>6ED1 057-3AA00-0BA8</b> |

B) Subject to export regulations: AL: N and ECCN: EAR99S

C) Subject to export regulations: AL: N and ECCN: EAR99T

Overview



- Expansion module for LOGO! basic versions
- For communication between the LOGO! master and external EIB components through EIB

Technical specifications

| CM EIB/KNX                             |   |
|--|---|
| Supply voltage                         | 24 V AC/DC                              |
| Inputs, max.                           | 16 DE/12 DA/8 AE/2 AA                   |
| Outputs, max.                          | 16 digital                              |
| Continuous current                     | 25 mA                                   |
| Short-circuit protection               | External fuse protection is required    |
| Integrated time switches/power reserve | –                                       |
| Ambient temperature                    | 0 to +55 °C                             |
| RI specification                       | To EN 55 011 (limit class B)            |
| Degree of protection                   | IP20                                    |
| Certification                          | to VDE 0631, IEC61131-2, cULus, FM      |
| Mounting                               | On DIN rail 35 mm, 2 module widths wide |
| Dimensions (W x H x D) in mm           | 36 (2 TE) x 90 x 55                     |

Ordering Data

| Order No.  |
|--|
| <b>LOGO!<sup>A)</sup> CM EIB KNX communications module</b> |
| 6BK1 700-0BA00-0AA1  |
| For connecting to EIB, 24 V DC supply voltage              |

Accessories

LOGO! Manual

|         |                     |
|---------|---------------------|
| German  | 6ED1 050-1AA00-0AE5 |
| English | 6ED1 050-1AA00-0BE5 |
| French  | 6ED1 050-1AA00-0CE5 |
| Spanish | 6ED1 050-1AA00-0DE5 |
| Italian | 6ED1 050-1AA00-0EE5 |

A) Subject to export regulations: AL: N and ECCN: EAR99H

Overview

Each LOGO! can now be connected to the AS-Interface system



An intelligent slave can be integrated into the AS-Interface system with the AS-Interface for LOGO!. The modular interface allows the different basic units to be integrated into the system depending on the required functionality. In addition, the functionality can be quickly and simply adapted to changed requirements by replacing the basic unit.

The interface provides four inputs and four outputs for the system. These I/Os, however, are not implemented in hardware, but are only virtually available via the interface.

Technical specifications

| Supply voltage in V          | 24 V DC   |     |        |       |    |     |                 |                    |              |
|------------------------------|---|-----|--------|-------|----|-----|-----------------|--------------------|--------------|
| Inputs/outputs               | 4 / 4<br>(virtual inputs/outputs)   |     |        |       |    |     |                 |                    |              |
| Bus connection               | AS-Interface according to specification   |     |        |       |    |     |                 |                    |              |
| Ambient temperature in °C    | 0 ... +55   |     |        |       |    |     |                 |                    |              |
| Degree of protection         | IP20  |     |        |       |    |     |                 |                    |              |
| Mounting                     | onto standard mounting rail   |     |        |       |    |     |                 |                    |              |
| Dimensions (W x H x D) in mm | 36 x 90 x 58  |     |        |       |    |     |                 |                    |              |
| LED displays                 | <table border="1"> <thead> <tr> <th>LED</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Green</td> <td>OK</td> </tr> <tr> <td>Red</td> <td>No data traffic</td> </tr> <tr> <td>Flashes red/yellow</td> <td>Zero address</td> </tr> </tbody> </table> | LED | Status | Green | OK | Red | No data traffic | Flashes red/yellow | Zero address |
| LED                          | Status  |     |        |       |    |     |                 |                    |              |
| Green                        | OK  |     |        |       |    |     |                 |                    |              |
| Red                          | No data traffic   |     |        |       |    |     |                 |                    |              |
| Flashes red/yellow           | Zero address  |     |        |       |    |     |                 |                    |              |

Ordering Data

| AS-Interface connection for LOGO! | Order No.           |
|-----------------------------------|---------------------|
|                                   | 3RK1 400-0CE10-0AA2 |

### Application



LOGO!Power supplies are primary switched-mode power supplies that are optimized to the LOGO! logic modules in terms of functionality and design.

In accordance with the required performance, the LOGO!Power supplies are available in two sizes, whereby the new generation is now even more compact despite the extended functionality. The width of the smaller type is only 54 mm now instead of the previous 72 mm and the larger type has been reduced in size from 126 mm to 72 mm. An extremely compact 4 A type with only 90 mm width completes the LOGO!Power family. An LED indicates whether the output voltage level is correct and, in the event

of an overload or short-circuit, the primary switched-mode regulator delivers a constant current, i.e. without restart attempts.

LOGO!Power naturally supplies the small LOGO! control modules. They can, however, also be used elsewhere. Apart from their function as system power supplies, LOGO!Power is also suitable for supplying other consumers in the low-end performance range. With the wide input range of 85 V to 264 V AC and radio interference level B, they can be used universally in a diverse range of applications in the low-end performance range. Because the advantages of the primary switched-mode regulator convince customers right down the line.

For example:

- Enhanced protection of connected loads thanks to the regulated output voltage
- Low power loss in the control cabinet thanks to the high efficiency
- Compact design and low weight.

And LOGO!Power is predestined for equipment combinations in standard N distribution boards thanks to

- Mounting on a 35 mm standard rail
- Low mounting depth and stepped cross-section.

Of course, the power supplies comply with the relevant European and American regulations.

### Technical specifications LOGO!Power 12 V

| Type   | 12 V/1.9 A   | 12 V /4.5 A  |
|--|--|--|
| Order No.  | 6EP1 321-1SH02   | 6EP1 322-1SH02   |
| Input  | Single-phase AC  | Single-phase AC  |
| Rated voltage $V_{in \text{ rated}}$                       | 100-240 V AC wide-range input                            | 100-240 V AC wide-range input                            |
| Voltage range  | 85 V to 264 V AC   | 85 V to 264 V AC   |
| Overvoltage protection                                     | $2.3 \times V_{in \text{ rated}}/1.3 \text{ ms}$         | $2.3 \times V_{in \text{ rated}}/1.3 \text{ ms}$         |
| Mains buffering at $I_{out \text{ rated}}$                 | > 40 ms at $V_{in} = 187 \text{ V}$                      | > 40 ms at $V_{in} = 187 \text{ V}$                      |
| Rated mains frequency, range                               | 50/60 Hz; 47 to 63 Hz                                    | 50/60 Hz; 47 to 63 Hz                                    |
| Rated current $I_{in \text{ rated}}$                       | 0.53 - 0.3 A   | 1.13 - 0.43 A  |
| Inrush current limitation (+25°C)                          | < 15 A   | < 30 A   |
| $i^2t$   | < 0.8 A <sup>2</sup> s                                   | < 3 A <sup>2</sup> s                                     |
| Integrated line-side fuse                                  | Internal   | Internal   |
| Recommended circuit-breaker (IEC 898) in mains supply line | From 16 A Characteristic B or from 10 A Characteristic C | From 16 A Characteristic B or from 10 A Characteristic C |
| Output   | Stabilized, floating direct voltage                      | Stabilized, floating direct voltage                      |
| Rated voltage $V_{out \text{ rated}}$                      | 12 V DC  | 12 V DC  |
| Total tolerance, static                                    | ± 3 %  | ± 3 %  |
| •Static mains compensation                                 | Approx. 0.2 %  | Approx. 0.1 %  |
| •Static load stabilization                                 | Approx. 1.5 %  | Approx. 1.5 %  |
| Residual ripple (frequency approx. 90 kHz)                 | < 200 mV <sub>pp</sub>                                   | < 200 mV <sub>pp</sub>                                   |
| Spikes (bandwidth approx. 20 MHz)                          | < 300 mV <sub>pp</sub>                                   | < 300 mV <sub>pp</sub>                                   |
| Setting range  | 10.5 to 16.1 V   | 10.5 to 16.1 V   |

Technical specifications LOGO!Power 12 V (Continued)

| Type   | 12 V/1.9 A  | 12 V /4.5 A   |
|--|---|---|
| Order No.  | 6EP1 321-1SH02  | 6EP1 322-1SH02  |
| Status display   | Green LED for output voltage OK   | Green LED for output voltage OK   |
| Power ON/OFF behavior  | No overshoot of V <sub>out</sub> (soft start)   | No overshoot of V <sub>out</sub> (soft start)   |
| Starting delay/voltage rise                                  | < 0.5 s/typ. 15 ms  | < 0.5 s/typ. 10 ms  |
| Rated current I <sub>outrated</sub>                          | 1.9 A   | 4.5 A   |
| Current range up to +55 °C                                   | 0 to 1.9 A  | 0 to 4.5 A  |
| Parallel connection for increased output                     | Yes   | Yes   |
| <b>Efficiency</b>  |   |   |
| Efficiency at V <sub>outrated</sub> , I <sub>out rated</sub> | typ. 80 %   | typ. 85 %   |
| Power loss at V <sub>outrated</sub> , I <sub>out rated</sub> | typ. 5 W  | typ. 10 W   |
| <b>Control</b>   |   |   |
| Dyn. mains compensation (V <sub>out rated</sub> ± 15%)       | < 0.2 % V <sub>out</sub>  | < 0.2 % V <sub>out</sub>  |
| Dyn. load compensation (I <sub>out</sub> :10/90/10 %)        | ± 3 % V <sub>out</sub>  | ± 4.2 % V <sub>out</sub>  |
| Settling time  |   |   |
| •Load step from 10 to 90%                                    | typ. 20 ms  | typ. 20 ms  |
| •Load step from 90 to 10%                                    | typ. 20 ms  | typ. 20 ms  |
| <b>Protection and monitoring</b>                             |   |   |
| Current limitation   | typ. 2.5 A  | typ. 5.9 A  |
| Short-circuit protection                                     | Constant current characteristic   | Constant current characteristic   |
| Continuous rms short-circuit current                         | < 4 A   | < 8 A   |
| Overload/short-circuit indicator                             | -   | -   |
| <b>Safety</b>  |   |   |
| Galvanic isolation primary/secondary                         | Yes, SELV output voltage V <sub>out</sub> acc. to EN 60950 and EN 50178   | Yes, SELV output voltage V <sub>out</sub> acc. to EN 60950 and EN 50178   |
| Protective class   | Class II (without PE conductor)   | Class II (without PE conductor)   |
| CE-marking   | Yes   | Yes   |
| UL/cUL (CSA), approval                                       | Yes, cULus listed (UL 508, CSA 22.2 No. 14-M95), File E197259; cURus recognized (UL 60950, CSA22.2 No. 60950), File E151273 | Yes, cULus listed (UL 508, CSA 22.2 No. 14-M95), File E197259; cURus recognized (UL 60950, CSA22.2 No. 60950), File E151273 |
| FM approval  | Yes, Class I Div. 2, Group A, B, C, D T4  | Yes, Class I Div. 2, Group A, B, C, D T4  |
| Appr. for use in marine vessels                              | Yes, GL, ABS  | Yes, GL, ABS  |
| Degree of protection (EN 60 529)                             | IP20  | IP20  |
| <b>EMC</b>   |   |   |
| Interference emission  | EN 55022 Class B  | EN 55022 Class B  |
| Line harmonics limitation                                    | Not applicable  | Not applicable  |
| Interference immunity  | EN 61000-6-2  | EN 61000-6-2  |
| <b>Operational data</b>                                      |   |   |
| Ambient temperature range                                    | -20 to +55 °C with natural convection   | -20 to +55 °C with natural convection   |
| Transportation and storage temperature range                 | -40 to +70 °C   | -40 to +70 °C   |
| Humidity class   | Climatic class 3K3 acc. to EN 60721, no condensation  | Climatic class 3K3 acc. to EN 60721, no condensation  |
| <b>Mechanical specifications</b>                             |   |   |
| Connections  |   |   |
| •Mains input L1, N   | One screw-type terminal each for 0.5 to 2.5 mm <sup>2</sup> single-core/finely stranded                                     | One screw-type terminal each for 0.5 to 2.5 mm <sup>2</sup> single-core/finely stranded                                     |
| •Output +<br>•Output   | 2 screw-type terminals each for 0.5 to 2.5 mm <sup>2</sup>  | 2 screw-type terminals each for 0.5 to 2.5 mm <sup>2</sup>  |
| Dimensions (W x H x D) in mm                                 | 54 x 90 x 55  | 72 x 90 x 55  |
| Weight   | Approx. 0.17 kg   | Approx. 0.25 kg   |
| Mounting   | Snap-mounting on DIN rail EN 50022-35x15/7.5  | Snap-mounting on DIN rail EN 50022-35x15/7.5  |

Technical specifications LOGO!Power 24 V

| Type   | 24 V/1.3 A   | 24 V/2.5 A   | 24 V/4 A   |
|--|--|--|--|
| Order No.  | 6EP1 331-1SH02   | 6EP1 332-1SH42   | 6EP1 332-1SH51   |
| Input  | Single-phase AC  | Single-phase AC  | Single-phase AC  |
| Rated voltage $V_{in rated}$                               | 100 to 240 V AC wide-range input                         | 100 to 240 V AC wide-range input                         | 100 to 240 V AC wide-range input                         |
| Voltage range  | 85 to 264 V AC   | 85 to 264 V AC   | 85 to 264 V AC   |
| Overvoltage strength                                       | $2.3 \times V_{in rated}/1.3 \text{ ms}$                 | $2.3 \times V_{in rated}/1.3 \text{ ms}$                 | $2.3 \times V_{in rated}/1.3 \text{ ms}$                 |
| Mains buffering at $I_{out rated}$                         | > 40 ms at $V_{in} = 187 \text{ V}$                      | > 40 ms at $V_{in} = 187 \text{ V}$                      | > 40 ms at $V_{in} = 187 \text{ V}$                      |
| Mains frequency nominal value and range                    | 50/60 Hz; 47 to 63 Hz                                    | 50/60 Hz; 47 to 63 Hz                                    | 50/60 Hz; 47 to 63 Hz                                    |
| Rated current $I_{in rated}$                               | 0.7 - 0.35 A   | 1.22 - 0.66 A  | 1.95 - 0.97 A  |
| Inrush current limiting (+25 °C)                           | < 15 A   | < 30 A   | < 30 A   |
| $I^2t$   | < 0.8 A <sup>2</sup> s                                   | < 3 A <sup>2</sup> s                                     | < 2.5 A <sup>2</sup> s                                   |
| Built-in input fuse  | Internal   | Internal   | Internal   |
| Recommended circuit-breaker (IEC 898) in mains supply line | From 16 A Characteristic B or from 10 A Characteristic C | From 16 A Characteristic B or from 10 A Characteristic C | From 16 A Characteristic B or from 10 A Characteristic C |
| Output   | Stabilized, floating direct voltage                      | Stabilized, floating direct voltage                      | Stabilized, floating direct voltage                      |
| Rated voltage $V_{out rated}$                              | 24 V DC  | 24 V DC  | 24 V DC  |
| Total tolerance, static                                    | ± 3 %  | ± 3 %  | ± 3 %  |
| •Static mains stabilization                                | Approx. 0.1 %  | Approx. 0.1 %  | Approx. 0.1 %  |
| •Static load stabilization                                 | Approx. 1.5 %  | Approx. 1.5 %  | Approx. 1.5 %  |
| Residual ripple (frequency approx. 90 kHz)                 | < 200 mV <sub>pp</sub>                                   | < 200 mV <sub>pp</sub>                                   | < 200 mV <sub>pp</sub>                                   |
| Spikes (bandwidth approx. 20 MHz)                          | < 300 mV <sub>pp</sub>                                   | < 300 mV <sub>pp</sub>                                   | < 300 mV <sub>pp</sub>                                   |
| Setting range  | 22.2 to 26.4 V   | 22.2 to 26.4 V   | 22.2 to 26.4 V   |
| Status display   | Green LED for output voltage OK                          | Green LED for output voltage OK                          | Green LED for output voltage OK                          |
| Switch-On/Switch-Off response                              | No overshoot of $V_{out}$ (soft start)                   | No overshoot of $V_{out}$ (soft start)                   | No overshoot of $V_{out}$ (soft start)                   |
| Starting delay/voltage rise                                | < 0.5 s/typ. 15 ms                                       | < 0.5 s/typ. 10 ms                                       | < 0.5 s/typ. 35 ms                                       |
| Rated current $I_{out rated}$                              | 1.3 A  | 2.5 A  | 4 A  |
| Current range up to +55 °C                                 | 0 to 1.3 A   | 0 to 2.5 A   | 0 to 4 A   |
| Parallel connection for increased output                   | Yes  | Yes  | Yes  |
| Efficiency   |  |  |  |
| Efficiency at $V_{out rated}$ , $I_{out rated}$            | typ. 82 %  | typ. 87 %  | typ. 89 %  |
| Power loss at $V_{out rated}$ , $I_{out rated}$            | typ. 7 W   | typ. 9 W   | typ. 12 W  |
| Control  |  |  |  |
| Dyn. mains compensation ( $V_{in rated} \pm 15 \%$ )       | < 0.2 % $V_{out}$  | < 0.2 % $V_{out}$  | < 0.2 % $V_{out}$  |
| Dyn. load compensation ( $I_{out}$ : 10/90/10 %)           | ± 1.5 % $V_{out}$  | ± 1.5 % $V_{out}$  | ± 1.5 % $V_{out}$  |
| Settling time  |  |  |  |
| •Load step from 10 to 90%                                  | typ. 20 ms   | typ. 20 ms   | typ. 20 ms   |
| •Load step from 90 to 10%                                  | typ. 20 ms   | typ. 20 ms   | typ. 20 ms   |
| Protection and monitoring                                  |  |  |  |
| Current limiting   | typ. 2 A   | typ. 3.4 A   | typ. 4.7 A   |
| Short-circuit protection                                   | Constant current characteristic                          | Constant current characteristic                          | Constant current characteristic                          |
| Continuous short-circuit rms current                       | < 4 A  | < 8 A  | < 10 A   |
| Overload/short-circuit indicator                           | -  | -  | -  |



Technical specifications LOGO!Power 24 V (Continued)

| Type                                    | 24 V/1.3 A   | 24 V/2.5 A   | 24 V/4 A   |
|---|--|--|--|
| <b>Safety</b>                           |  |  |  |
| Galvanic isolation, primary/secondary   | Yes, SELV output voltage $V_{out}$ acc. to EN 60950 and EN 50178                                       | Yes, SELV output voltage $V_{out}$ acc. to EN 60950 and EN 50178                                       | Yes, SELV output voltage $V_{out}$ acc. to EN 60950 and EN 50178                                       |
| Protective class                        | Class II (without PE conductor)  | Class II (without PE conductor)  | Class II (without PE conductor)  |
| CE-marking                              | Yes  | Yes  | Yes  |
| UL/cUL (CSA), approval                  | Yes, cULus listed (UL 508, CSA 22.2), File E197259; cURus recognized (UL 60950, CSA22.2), File E151273 | Yes, cULus listed (UL 508, CSA 22.2), File E197259; cURus recognized (UL 60950, CSA22.2), File E151273 | Yes, cULus listed (UL 508, CSA 22.2), File E197259; cURus recognized (UL 60950, CSA22.2), File E151273 |
| FM approval                             | Yes, Class I Div. 2, Group A, B, C, D T4   | Yes, Class I Div. 2, Group A, B, C, D T4   | Available soon   |
| Appr. for use in marine vessels         | Yes, GL, ABS   | Yes, GL, ABS   | Yes, GL, ABS   |
| Degree of protection (EN 60 529)        | IP20   | IP20   | IP20   |
| <b>EMC</b>                              |  |  |  |
| Interference emission                   | EN 55022 Class B   | EN 55022 Class B   | EN 55022 Class B   |
| Mains harmonics limitation              | Not applicable   | Not applicable   | EN 61000-3-2   |
| Interference immunity                   | EN 61000-6-2   | EN 61000-6-2   | EN 61000-6-2   |
| <b>Operational data</b>                 |  |  |  |
| Ambient temperature range               | -20 to +55°C with natural convection   | -20 to +55°C with natural convection   | -20 to +55°C with natural convection   |
| Transport and storage temperature range | -40 to +70 °C  | -40 to +70 °C  | -40 to +70 °C  |
| Humidity class                          | Climatic class 3K3 acc. to EN 60721, no condensation   | Climatic class 3K3 acc. to EN 60721, no condensation   | Climatic class 3K3 acc. to EN 60721, no condensation   |
| <b>Mechanical specifications</b>        |  |  |  |
| Mains input connections L1, N           | One screw-type terminal each for 0.5 to 2.5 mm <sup>2</sup> single-core/finely stranded                | One screw-type terminal each for 0.5 to 2.5 mm <sup>2</sup> single-core/finely stranded                | One screw-type terminal each for 0.5 to 2.5 mm <sup>2</sup> single-core/finely stranded                |
| Connections<br>•Output +<br>•Output     | 2 screw-type terminals each for 0.5 to 2.5 mm <sup>2</sup>   | 2 screw-type terminals each for 0.5 to 2.5 mm <sup>2</sup>   | 2 screw-type terminals each for 0.5 to 2.5 mm <sup>2</sup>   |
| Dimensions (W x H x D) in mm            | 54 x 90 x 55   | 72 x 90 x 55   | 90 x 90 x 55   |
| Weight                                  | Approx. 0.17 kg  | Approx. 0.25 kg  | Approx. 0.34 kg  |
| Mounting                                | Snap-mounting on DIN rail EN 50022-35x15/7.5   | Snap-mounting on DIN rail EN 50022-35x15/7.5   | Snap-mounting on DIN rail EN 50022-35x15/7.5   |

| Ordering Data  | Order No.             |
|--|-----------------------|
| <b>LOGO!Power 12 V 1.9 A</b><br>Input 100-240 V AC<br>Output 12 V DC, 1.9 A          | <b>6EP1 321-1SH02</b> |
| <b>LOGO!Power 12 V 4.5 A</b><br>Input 100-240 V AC<br>Output 12 V DC, 4.5 A          | <b>6EP1 322-1SH02</b> |
| <b>LOGO!Power 24 V 1.3 A</b><br>Input 100-240 V AC<br>Output 24 V DC, 1.3 A          | <b>6EP1 331-1SH02</b> |
| <b>LOGO!Power 24 V 2.5 A</b><br>Input 100-240 V AC<br>Output 24 V DC, 2.5 A          | <b>6EP1 332-1SH42</b> |
| <b>LOGO!Power 24 V 4 A<sup>A)</sup></b><br>Input 100-240 V AC<br>Output 24 V DC, 4 A | <b>6EP1 332-1SH51</b> |

A) Subject to export regulations: AL: N and ECCN: EAR99H

Overview



- Switching module for the direct switching of resistive loads and motors

Technical specifications

|                              | 6ED1 057-4CA00-0AA0 | 6ED1 057-4EA00-0AA0 |
|------------------------------|---------------------|---------------------|
| <b>Dimensions and weight</b> |                     |                     |
| •Weight, approx.             | 160 g               | 160 g               |

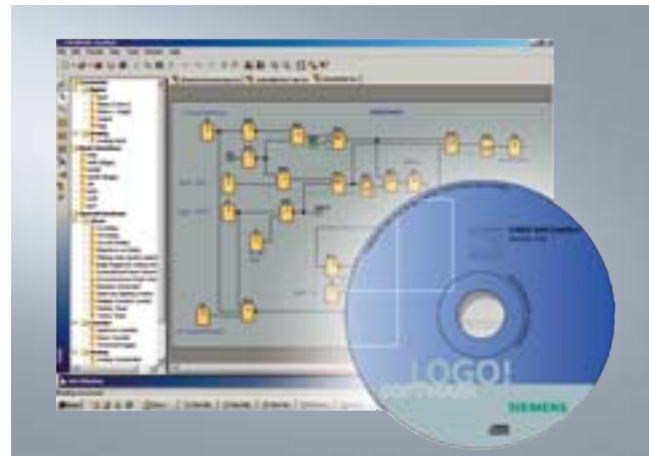
Ordering Data

**LOGO!Contact**  
Module for direct switching of resistive consumers up to 20 A and motors up to 4 kW  
Switching voltage 24 V  
Switching voltage 230 V

Order No.

|                            |
|----------------------------|
| <b>6ED1 057-4CA00-0AA0</b> |
| <b>6ED1 057-4EA00-0AA0</b> |

Overview



Ordering Data

Order No.

|  |                            |
|--|----------------------------|
| <b>LOGO!Soft Comfort V4.0</b> <sup>B)</sup><br>For programming on the PC in LAD/SFC; executes on Windows 95 and higher, Linux, MAC OS X; on CD-ROM | <b>6ED1 058-0BA00-0YA0</b> |
| <b>LOGO!Soft Comfort Upgrade</b> <sup>B)</sup><br>V1.0 upwards to V4.0   | <b>6ED1 058-0CA00-0YE0</b> |

B) Subject to export regulations: AL: N and ECCN: EAR99S

- The user-friendly software for creating control programs on a PC
- Creation of control programs in Control System Flowchart (CSF) or Ladder Diagram (LAD)
- Plus testing, simulation, online testing and archiving of control programs
- Professional documentation via numerous comment and print functions

**Minimum system requirements**

Windows 95/98, NT 4.0, ME, 2000 or XP

- Pentium PC
- 90 MB free disk space
- 64 MB RAM
- SVGA graphics card with minimum resolution 800x600 (256 colors)

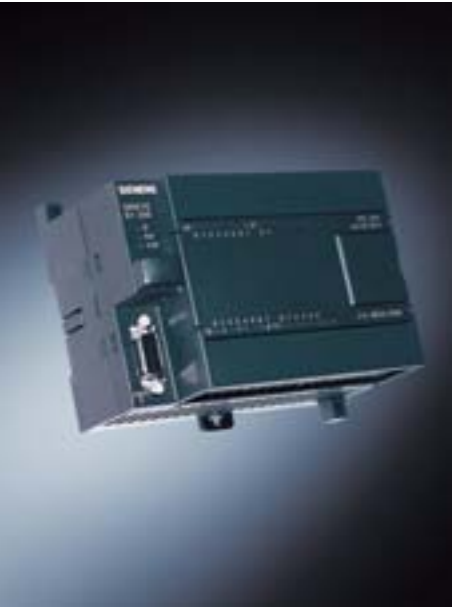
Mac OS X

- PowerMac G3, G4, G4 Cube, iMac, PowerBook G3, G4 or iBook

Linux (tested using Caldera OpenLinux 2.4)

- Will function on all Linux distributions on which Java 2 SDK version 1.3.1 is running
- Please refer to your respective Linux distribution for the hardware requirements.





|             |  |
|-------------|--|
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| <b>3/4</b>  | <b>Central processing units</b>        |
| 3/4         | CPU 221, 222, 224, 224 XP, 226         |
| <b>3/22</b> | <b>SIPLUS central processing units</b> |
| 3/22        | SIPLUS central processing units        |
| <b>3/23</b> | <b>Digital modules</b>                 |
| 3/23        | Digital modules                        |
| <b>3/30</b> | <b>SIPLUS digital modules</b>          |
| 3/30        | SIPLUS digital modules                 |
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| 3/34        | EM 231 thermocouple module             |
| 3/36        | EM 231 RTD module                      |
| <b>3/38</b> | <b>SIPLUS analog modules</b>           |
| 3/38        | SIPLUS analog modules                  |
| <b>3/39</b> | <b>Function modules</b>                |
| 3/39        | EM 253 positioning module              |
| <b>3/41</b> | <b>Communication</b>                   |
| 3/41        | EM 241 modem                           |
| 3/42        | EM 277 PROFIBUS DP module              |
| 3/43        | CP 243-2                               |
| 3/44        | CP 243-1                               |
| 3/45        | CP 243-1 IT                            |
| <b>3/46</b> | <b>Power supplies</b>                  |
| 3/46        | Power supplies                         |
| <b>3/48</b> | <b>Human Machine Interface</b>         |
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| 3/49        | TD 200C text display                   |
| 3/50        | SIMATIC TP 177micro                    |
| 3/53        | SIMATIC OP 73micro                     |
| <b>3/55</b> | <b>Software</b>                        |
| 3/55        | Software                               |





#### **SIMATIC S7-200**

- The micro PLC offers maximum automation at minimum cost
- Extremely simple installation, programming and operation
- Large-scale integration, space-saving, powerful
- Can be used both for simple controls and for complex automation tasks
- All CPUs can be used in stand alone mode, in networks and within distributed structures
- Suitable for applications where programmable controllers would not have been viable in the past
- With outstanding real-time performance and powerful communication options (PPI, PROFIBUS DP, AS-Interface)
- Shipbuilding certification from
  - American Bureau of Shipping (ABS)
  - Bureau Veritas (BV)
  - Det Norske Veritas (DNV)
  - Germanischer Lloyd (GL)
  - Lloyds Register of Shipping (LRS)
  - Registro Italiano Navale (RINA)
  - Nippon Kaiji Kyokai (NK)

#### **SIPLUS S7-200**

- The PLC for use in the harshest environmental conditions
- With extended temperature range from -25 to +70°C
- Suitable for extraordinary medial load (pollution gas atmosphere)
- Occasional short-term condensation and increased mechanical loading permissible
- With the proven PLC technology of the S7-200
- Convenient handling, programming, maintenance and service
- Ideal for use in the automotive industry, environmental technology, mining, chemical plants, production technology, food industry etc.
- The alternative to expensive custom solutions

More Information you can find at:

<http://www.siemens.com/siplus>



### Technical specifications

#### General Technical specifications SIMATIC S7-200

|   |   |
|---|---|
| Degree of protection  | IP20 in accordance with IEC 529   |
| Ambient temperature   |   |
| <ul style="list-style-type: none"> <li>• Operation (95% relative humidity) <ul style="list-style-type: none"> <li>- With horizontal mounting</li> <li>- With vertical mounting</li> </ul> </li> <li>• Transport and storageGeneral <ul style="list-style-type: none"> <li>- with 95% relative humidity</li> </ul> </li> </ul> | <p>0 to 55°C</p> <p>0 to 45 °C</p> <p>-40 to +70 °C</p> <p>25 to 55 °C</p>  |
| Isolation   |   |
| <ul style="list-style-type: none"> <li>• 5/24 V DC circuits</li> <li>• 115/230 V AC circuits to ground</li> <li>• 115/230 V AC circuits to 115/230 V AC circuits</li> <li>• 230 V AC circuits to 5/24 V DC circuits</li> <li>• 115 V AC circuits to 5/24 V DC circuits</li> </ul>   | <p>Test voltage 500 V AC</p> <p>Test voltage 1500 V AC</p> <p>Test voltage 1500 V AC</p> <p>Test voltage 1500 V AC</p> <p>Test voltage 1500 V AC</p>  |
| Electromagnetic compatibility   | Requirements of EMC law   |
| <ul style="list-style-type: none"> <li>• Noise immunity to EN 50082-2</li> <li>• Emitted interference according to EN 50081-1 and EN 50081-2</li> </ul>   | <p>Tested according to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160</p> <p>Tested according to EN 55011, Class A, Group 1 and EN 55011, Class B, Group 1</p>   |
| Mechanical rating   |   |
| <ul style="list-style-type: none"> <li>• Vibrations, tested according to/tested with</li> <li>• Shock, tested according to/tested with</li> </ul>   | <p>IEC 68, Part 2-6: 10 to 57 Hz; constant amplitude 0.3 mm; 58 to 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in control cabinet); type of vibration: frequency cycles with a rate of change of 1 octave/minute; vibration duration: 10 frequency cycles per axis in each direction of the 3 mutually perpendicular axes</p> <p>IEC 68, Part 2-27/half-sine: shock strength 15 g (peak value), duration 11 ms, 6 shocks on each of the 3 mutually perpendicular axes</p> |

#### General Technical specifications SIPLUS S7-200

|  |   |
|--|---|
| <b>Ambient temperature</b>                 |   |
| Temperature                                | Horizontal mounting: -25 °C to 70 °C<br>Vertical mounting: -25 °C to 50 °C  |
| Relative humidity                          | 5 to 95%; transient condensation permissible, corresponding to relative humidity (RH-) stress grade 2 according to IEC 1131-2 and IEC 721 3-3 Cl. 3K5   |
| Transient icing                            | -25 °C to 0 °C<br>IEC 721 3-3 Cl. 3K5   |
| Atmospheric pressure                       | 1080 to 795 hPa corresponding to a height of -1000 to 2000 m  |
| Pollutant concentration                    | SO2: < 0,5 ppm; relative humidity <60% Test: 10 ppm, 4 days<br>H2S: < 0,1 ppm; relative humidity <60% Test: 1 ppm, 4 days (according to IEC 721 3-3; Class 3C3)   |
| <b>Mechanical environmental conditions</b> |   |
| Vibrations                                 | Type of vibration: frequency progressions changing at 1 octave per minute.<br>2 Hz ≤ f ≤ 9 Hz, constant amplitude 3,0 mm 9 Hz ≤ f ≤ 150 Hz, constant acceleration 1 g;<br>Duration of vibration: 10 frequency progressions per axis in each direction of the three mutually perpendicular axes;<br>Vibration testing according to IEC 68 section 2-6 (Sinus) and IEC 721 3-3, Class 3M4 |
| Shock                                      | Type of shock: semisinusoidal shock strength: 15 g peak value, duration shock direction 11 ms: 3 shocks each in +/- direction on each of the mutually perpendicular axes<br>Shock testing according to IEC 68 section 2-27  |
| Conformity                                 | EN 50155 (railroad applications - electronical device on rail vehicles)   |

### Overview

3



- The smart compact solution
- With 10 inputs/outputs on board
- Not expandable



- The compact high-performance CPU
- With 24 inputs/outputs on board
- Expandable with up to 7 expansion modules



- The superior compact solution
- With 14 inputs/outputs on board
- Expandable with up to 2 expansion modules



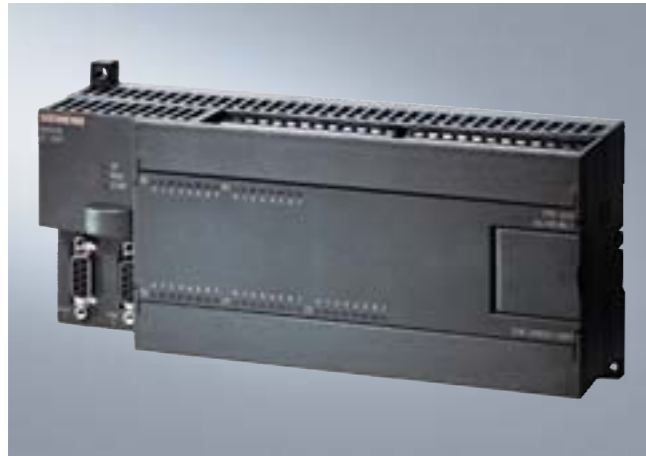
- The power CPU
- With 24 digital and 3 analog inputs/outputs onboard
- Expandable with up to 7 expansion modules

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

### Overview



- The high-performance package for complex technical tasks
- With additional PPI port for added flexibility and communication options
- With 40 inputs/outputs on board
- Expansion capability for max. 7 expansion racks

3

### Technical specifications

|  | 6ES7 211-0AA23-0XB0  | 6ES7 211-0BA23-0XB0   | 6ES7 212-1AB23-0XB0  | 6ES7 212-1BB23-0XB0   |
|--|----------------------|---|--|---|
| <b>Supply voltages</b>                     |                      |   |  |   |
| Rated value                                |                      |   |  |   |
| - 24 V DC                                  | Yes                  |   | Yes  |   |
| - permissible range, lower limit (DC)      | 20.4 V               |   | 20.4 V   |   |
| - permissible range, upper limit (DC)      | 28.8 V               |   | 28.8 V   |   |
| - 120 V AC                                 |                      | Yes   |  | Yes   |
| - 230 V AC                                 |                      | Yes   |  | Yes   |
| - permissible range, lower limit (AC)      |                      | 85 V  |  | 85 V  |
| - permissible range, upper limit (AC)      |                      | 264 V   |  | 264 V   |
| - permissible frequency range, lower limit |                      | 47 Hz   |  | 47 Hz   |
| - permissible frequency range, upper limit |                      | 63 Hz   |  | 63 Hz   |
| <b>Voltages and currents</b>               |                      |   |  |   |
| Load voltage L+                            |                      |   |  |   |
| - Rated value (DC)                         | 24 V                 | 24 V  | 24 V   | 24 V  |
| - permissible range, lower limit (DC)      | 20.4 V               | 5 V   | 20.4 V   | 5 V   |
| - permissible range, upper limit (DC)      | 28.8 V               | 30 V  | 28.8 V   | 30 V  |
| Load voltage L1                            |                      |   |  |   |
| - Rated value (AC)                         |                      | 100 V; 100 to 230 V AC  |  | 100 V; 100 to 230 V AC  |
| - permissible range, lower limit (AC)      |                      | 5 V   |  | 5 V   |
| - permissible range, upper limit (AC)      |                      | 250 V   |  | 250 V   |
| - permissible frequency range, lower limit |                      | 47 Hz   |  | 47 Hz   |
| - permissible frequency range, upper limit |                      | 63 Hz   |  | 63 Hz   |
| <b>Current consumption</b>                 |                      |   |  |   |
| • Inrush current, max.                     | 10 A; at 28.8 V      | 20 A; at 264 V  | 10 A; at 28.8 V  | 20 A; at 264 V  |
| • from supply voltage L+, max.             | 450 mA; 80 to 450 mA |   | 500 mA; 85 to 500 mA, output current for expansion modules (5 V DC) 340 mA |   |
| • from supply voltage L1, max.             |                      | 120 mA; 15 to 60 mA (240 V), 30 to 120 mA (120 V); output current for expansion modules (5 V DC) 340 mA |  | 140 mA; 20 to 70 mA (240 V), 40 to 140 mA (120 V); output current for expansion modules (5 V DC) 340 mA |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

### Technical specifications (continued)

|   | 6ES7 211-0AA23-0XB0  | 6ES7 211-0BA23-0XB0  | 6ES7 212-1AB23-0XB0  | 6ES7 212-1BB23-0XB0  |
|---|--|--|--|--|
| back-up battery<br>- Backup time  | 50 h; (min. 8 h at 40 °C);<br>200 days (typ.) with<br>optional battery module  | 50 h; (min. 8 h at 40 °C);<br>200 days (typ.) with<br>optional battery module  | 50 h; (min. 8 h at 40 °C);<br>200 days (typ.) with<br>optional battery module  | 50 h; (min. 8 h at 40 °C);<br>200 days (typ.) with<br>optional battery module  |
| <b>Memory/backup</b>  |  |  |  |  |
| Memory<br>- Number of memory modules<br>(optional)                                  | 1; pluggable memory<br>module, content<br>identical to integral<br>EEPROM, in addition,<br>recipes, data logs and<br>other files can be saved.   | 1; pluggable memory<br>module, content<br>identical to integral<br>EEPROM, in addition,<br>recipes, data logs and<br>other files can be saved.   | 1; pluggable memory<br>module, content<br>identical to integral<br>EEPROM, in addition,<br>recipes, data logs and<br>other files can be saved.   | 1; pluggable memory<br>module, content<br>identical to integral<br>EEPROM, in addition,<br>recipes, data logs and<br>other files can be saved.   |
| •Data memory<br>and program memory<br>- Data memory, max.<br>- Program memory, max. | 2 KByte<br>4 KByte   | 2 KByte<br>4 KByte   | 2 KByte<br>4 KByte   | 2 KByte<br>4 KByte   |
| Backup<br>- available   | Yes; Program: entire<br>program maintenance-<br>free in integral EEPROM,<br>programmable via CPU;<br>data: entire DB 1 loaded<br>from PG/PC<br>maintenance-free in<br>integral EEPROM,<br>current values of DB 1 in<br>RAM, retentive flags,<br>timers, counters etc.,<br>maintenance free via<br>super capacitor;<br>optional battery | Yes; Program: entire<br>program maintenance-<br>free in integral EEPROM,<br>programmable via CPU;<br>data: entire DB 1 loaded<br>from PG/PC<br>maintenance-free in<br>integral EEPROM,<br>current values of DB 1 in<br>RAM, retentive flags,<br>timers, counters etc.,<br>maintenance free via<br>super capacitor;<br>optional battery | Yes; Program: entire<br>program maintenance-<br>free in integral EEPROM,<br>programmable via CPU;<br>data: entire DB 1 loaded<br>from PG/PC<br>maintenance-free in<br>integral EEPROM,<br>current values of DB 1 in<br>RAM, retentive flags,<br>timers, counters etc.,<br>maintenance free via<br>super capacitor;<br>optional battery | Yes; Program: entire<br>program maintenance-<br>free in integral EEPROM,<br>programmable via CPU;<br>data: entire DB 1 loaded<br>from PG/PC<br>maintenance-free in<br>integral EEPROM,<br>current values of DB 1 in<br>RAM, retentive flags,<br>timers, counters etc.,<br>maintenance free via<br>super capacitor;<br>optional battery |
| <b>CPU/processing times</b><br>•for bit instruction, max.                           | 0,22 µs  | 0,22 µs  | 0,22 µs  | 0,22 µs  |
| <b>Timers/counters and their reten-<br/>tive characteristics</b>                    |  |  |  |  |
| S7 counter<br>- Number  | 256  | 256  | 256  | 256  |
| •of which retentive with battery<br>- adjustable                                    | Yes; via super capacitor<br>or battery   | Yes; via super capacitor<br>or battery   | Yes; via super capacitor<br>or battery   | Yes; via super capacitor<br>or battery   |
| - lower limit   | 1  | 1  | 1  | 1  |
| - upper limit   | 256  | 256  | 256  | 256  |
| •Counting range<br>- lower limit  | 0  | 0  | 0  | 0  |
| - upper limit   | 32.767   | 32.767   | 32.767   | 32.767   |
| S7 times<br>- Number  | 256  | 256  | 256  | 256  |
| •of which retentive with battery<br>- adjustable                                    | Yes; via super capacitor<br>or battery   | Yes; via super capacitor<br>or battery   | Yes; via super capacitor<br>or battery   | Yes; via super capacitor<br>or battery   |
| - upper limit   | 64   | 64   | 64   | 64   |
| •Timing range<br>- lower limit  | 1 ms   | 1 ms   | 1 ms   | 1 ms   |
| - upper limit   | 54 min; 4 times,<br>1 ms to 30 s 16 times,<br>10 ms to 5 min<br>236 times,<br>100 ms to 54 min   | 54 min; 4 times,<br>1 ms to 30 s 16 times,<br>10 ms to 5 min<br>236 times,<br>100 ms to 54 min   | 54 min; 4 times,<br>1 ms to 30 s 16 times,<br>10 ms to 5 min<br>236 times,<br>100 ms to 54 min   | 54 min; 4 times,<br>1 ms to 30 s 16 times,<br>10 ms to 5 min<br>236 times,<br>100 ms to 54 min   |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

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### Technical specifications (continued)

|   | 6ES7 211-0AA23-0XB0   | 6ES7 211-0BA23-0XB0   | 6ES7 212-1AB23-0XB0   | 6ES7 212-1BB23-0XB0   |
|---|---|---|---|---|
| <b>Data areas and their retentive characteristics</b> |   |   |   |   |
| Flags   |   |   |   |   |
| - Number  | 32 Byte   | 32 Byte   | 32 Byte   | 32 Byte   |
| - adjustable retentivity                              | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  |
| - of which retentive with battery                     | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  |
| - of which retentive without battery                  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  |
| <b>Configuration</b>                                  |   |   |   |   |
| •Connectable programming devices/PCs                  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  |
| •Central units/expansion units, max.                  |   |   | 2 expansion modules. Only expansion modules of the S7-22x series can be used. Because of the limited output current, the use of expansion modules may be subject to restrictions.   | 2 expansion modules. Only expansion modules of the S7-22x series can be used (because of the limited output current, the use of expansion modules may be subject to restrictions.)  |
| I/O expansions  |   |   |   |   |
| - Analog inputs/outputs, max.                         |   |   | 10; max. 8 inputs and 2 outputs (EM) or max. 0 inputs and 4 outputs (EM)  | 10; max. 8 inputs and 2 outputs (EM) or max. 0 inputs and 4 outputs (EM)  |
| - Digital inputs/outputs, max.                        |   |   | 78; max. 40 inputs and 38 outputs (CPU+EM)  | 78; max. 40 inputs and 38 outputs (CPU+EM)  |
| - AS interface inputs/outputs, max.                   |   |   | 31; AS interface slaves (CP 243-2)  | 31; AS interface slaves (CP 243-2)  |
| <b>Connection system</b>                              |   |   |   |   |
| •Pluggable I/O terminals                              | No  | No  | No  | No  |
| <b>1st interface</b>                                  |   |   |   |   |
| •Type of interface                                    | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   |
| •Physical   | RS 485  | RS 485  | RS 485  | RS 485  |
| Functionality   |   |   |   |   |
| - MPI   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   |
| - PPI   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   |
| - Serial data transmission                            | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

### Technical specifications (continued)

|   | 6ES7 211-0AA23-0XB0  | 6ES7 211-0BA23-0XB0  | 6ES7 212-1AB23-0XB0  | 6ES7 212-1BB23-0XB0  |
|---|--|--|--|--|
| MPI   |  |  |  |  |
| - Transmission rates, max.                        | 187.5 kBit/s   | 187.5 kBit/s   | 187.5 kBit/s   | 187.5 kBit/s   |
| - Transmission rates, min.                        | 19.2 kBit/s  | 19.2 kBit/s  | 19.2 kBit/s  | 19.2 kBit/s  |
| <b>CPU programming</b>                            |  |  |  |  |
| Programming language                              |  |  |  |  |
| - LAD   | Yes  | Yes  | Yes  | Yes  |
| - FBD   | Yes  | Yes  | Yes  | Yes  |
| - STL   | Yes  | Yes  | Yes  | Yes  |
| •Instruction set                                  | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions |
| •User program protection/password protection      | Yes; 3-stage password protection   | Yes; 3-stage password protection   | Yes; 3-stage password protection   | Yes; 3-stage password protection   |
| •Program execution                                | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   |
| •Program organization                             | 1 OB, 1 DB, 1 SDB sub-programs with/without parameter transfer   | 1 OB, 1 DB, 1 SDB sub-programs with/without parameter transfer   | 1 OB, 1 DB, 1 SDB sub-programs with/without parameter transfer   | 1 OB, 1 DB, 1 SDB sub-programs with/without parameter transfer   |
| •Number of sub-programs, max.                     | 64   | 64   | 64   | 64   |
| <b>Digital inputs</b>                             |  |  |  |  |
| •Number of digital inputs                         | 6; integrated  | 6; integrated  | 8  | 8  |
| Length of cable                                   |  |  |  |  |
| - Length of cable shielded, max                   | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  |
| - Length of cable unshielded, max                 | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  |
| •m/p reading                                      | Yes; optional, per group   | Yes; optional, per group   | Yes; optional, per group   | Yes; optional, per group   |
| Input voltage                                     |  |  |  |  |
| - Rated value, DC                                 | 24 V   | 24 V   | 24 V   | 24 V   |
| - for signal "0"                                  | 0 to 5 V   | 0 to 5 V   | 0 to 5 V   | 0 to 5 V   |
| - for signal "1"                                  | min. 15 V  | min. 15 V  | min. 15 V  | min. 15 V  |
| Input current                                     |  |  |  |  |
| - for 1 signal, typical                           | 2.5 mA   | 2.5 mA   | 2.5 mA   | 2.5 mA   |
| Input delay (at rated value of the input voltage) |  |  |  |  |
| •For standard inputs                              |  |  |  |  |
| - Parameterizable                                 | Yes; all   | Yes; all   | Yes; all   | Yes; all   |
| - at 0 after 1, min.                              | 0.2 ms   | 0.2 ms   | 0.2 ms   | 0.2 ms   |
| - at 0 after 1, max.                              | 12.8 ms  | 12.8 ms  | 12.8 ms  | 12.8 ms  |
| •for alarm inputs                                 |  |  |  |  |
| - parameterizable                                 | Yes; I0.0 to I0.3  | Yes; I0.0 to I0.3  | Yes; I0.0 to I0.3  | Yes; I0.0 to I0.3  |
| •for counters/technological functions             |  |  |  |  |
| - parameterizable                                 | Yes; (E0.0 to E0.5) 30 kHz   | Yes; (E0.0 to E0.5) 30 kHz   | Yes; (E0.0 to E0.5) 30 kHz   | Yes; (E0.0 to E0.5) 30 kHz   |



# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

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### Technical specifications (continued)

|   | 6ES7 211-0AA23-0XB0   | 6ES7 211-0BA23-0XB0   | 6ES7 212-1AB23-0XB0   | 6ES7 212-1BB23-0XB0   |
|---|---|---|---|---|
| <b>Digital outputs</b>                                    |   |   |   |   |
| •Number of digital outputs                                | 4; Transistor   | 4; Relay  | 6; Transistor   | 6; Relay  |
| •Length of cable shielded, max.                           | 500 m   | 500 m   | 500 m   | 500 m   |
| •Length of cable unshielded, max.                         | 150 m   | 150 m   | 150 m   | 150 m   |
| •Short-circuit protection of the output                   | No; provided externally   | No; provided externally   | No; provided externally   | No; provided externally   |
| •Limitation of voltage induced on circuit interruption to | 1 W   |   | 1 W   |   |
| Switching capacity of the outputs                         |   |   |   |   |
| - at resistive load, max.                                 | 0.75 A  | 2 A   | 0.75 A  | 2 A   |
| - at lamp load, max.                                      | 5 W   | 30 W DC, 200 W AC   | 5 W   | 30 W DC, 200 W AC   |
| Output voltage  |   |   |   |   |
| - for 1 signal  | 20 V DC   | L+/L1   | 20 V DC   | L+/L1   |
| Output current  |   |   |   |   |
| - for 1 signal rated value                                | 750 mA  | 2 A   | 750 mA  | 2 A   |
| - for 0 signal residual current, max.                     | 0.1 mA  | 0 mA  | 10 µA   | 0 mA  |
| Output delay at resistive load                            |   |   |   |   |
| - "0" after "1", max.                                     | 15 µs; of standard outputs, max. (A0.2 to A0.3)<br>15 µs; of pulse outputs, max. (A0.0 to A0.1) 2 µs    | 10 ms; all outputs  | 15 µs; of standard outputs, max. (A0.2 to A0.5)<br>15 µs; of pulse outputs, max. (A0.0 to A0.1) 2 µs    | 10 ms; all outputs  |
| - "1" after "0", max.                                     | 130 µs; of standard outputs, max. (A0.2 to A0.3)<br>100 µs; of pulse outputs, max. (A0.0 to A0.1) 10 µs | 10 ms; all outputs  | 130 µs; of standard outputs, max. (A0.2 to A0.5)<br>100 µs; of pulse outputs, max. (A0.0 to A0.1) 10 µs | 10 ms; all outputs  |
| Parallel switching of 2 outputs                           |   |   |   |   |
| - to increase power                                       | Yes   | No  | Yes   | No  |
| Switching frequency                                       |   |   |   |   |
| - of pulse outputs, at resistive load, max.               | 20 kHz; A0.0 to A0.1  |   | 20 kHz; A0.0 to A0.1  |   |
| Summation current of the outputs (per group)              |   |   |   |   |
| - up to 40 °C, max.                                       | 3 A   | 6 A   | 4.5 A   | 6 A   |
| - horizontal installation, up to 55 °C, max.              | 3 A   | 6 A   | 4.5 A   | 6 A   |
| <b>Relay outputs</b>                                      |   |   |   |   |
| •Number of operating cycles                               |   | 10,000,000; mechanical<br>10 million, at rated load voltage 100,000 |   | 10,000,000; mechanical<br>10 million, at rated load voltage 100,000 |
| <b>Analog inputs</b>                                      |   |   |   |   |
| •Number of analog potentiometers                          | 1; Analog potentiometer; resolution 8 bits  | 1; Analog potentiometer; resolution 8 bits                          | 1; Analog potentiometer; resolution 8 bits  | 1; Analog potentiometer; resolution 8 bits                          |
| <b>Sensor supply</b>                                      |   |   |   |   |
| 24 V - sensor supply                                      |   |   |   |   |
| - 24 V  | Yes; permissible range: 15.4 to 28.8 V  | Yes; permissible range: 20.4 to 28.8 V                              | Yes; permissible range: 15.4 to 28.8 V  | Yes; permissible range: 20.4 to 28.8 V                              |
| - Short-circuit protection                                | Yes; electronic at 600 mA   | Yes; electronic at 600 mA   | Yes; electronic at 600 mA   | Yes; electronic at 600 mA   |
| - Output current, max.                                    | 180 mA  | 180 mA  | 180 mA  | 180 mA  |
| <b>Sensor</b>   |   |   |   |   |
| Connectable encoders                                      |   |   |   |   |
| - 2-wire BERS   | Yes   | Yes   | Yes   | Yes   |
| - permissible closed-circuit current (2-wire BERS), max.  | 1 mA  | 1 mA  | 1 mA  | 1 mA  |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

### Technical specifications (continued)

|  | 6ES7 211-0AA23-0XB0  | 6ES7 211-0BA23-0XB0  | 6ES7 212-1AB23-0XB0  | 6ES7 212-1BB23-0XB0  |
|--|--|--|--|--|
| <b>Integral functions</b>                    |  |  |  |  |
| •Number of counters                          | 4; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the set-point value is reached; change of count direction etc. | 4; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the set-point value is reached; change of count direction etc. | 4; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the set-point value is reached; change of count direction etc. | 4; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the set-point value is reached; change of count direction etc. |
| •Count frequency (counters) max.             | 30 kHz   | 30 kHz   | 30 kHz   | 30 kHz   |
| •Number of alarm inputs                      | 4; 4 rising edges and/or 4 falling edges   | 4; 4 rising edges and/or 4 falling edges   | 4; 4 rising edges and/or 4 falling edges   | 4; 4 rising edges and/or 4 falling edges   |
| •Number of pulse outputs                     | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation   | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation   | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation   | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation   |
| •Cut-off frequency (pulse)                   | 20 kHz   | 20 kHz   | 20 kHz   | 20 kHz   |
| <b>Potentials/ electrical isolation</b>      |  |  |  |  |
| Digital output functions                     |  |  |  |  |
| - between the channels                       | Yes; Optocoupler   | Yes; Relay   | Yes; Optocoupler   | Yes; Relay   |
| - between the channels, in groups of         | 4  | 1 and 3  | 6  | 3  |
| Digital input functions                      |  |  |  |  |
| - between the channels                       | Yes  | Yes  | Yes  | Yes  |
| - between the channels, in groups of         | 2 and 4  | 2 and 4  | 4  | 4  |
| <b>Permissible potential difference</b>      |  |  |  |  |
| •between different circuits                  | 500 V DC between 24 V DC and 5 V DC  | 500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC  | 500 V DC between 24 V DC and 5 V DC  | 500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC  |
| <b>Environmental requirements</b>            |  |  |  |  |
| •Environmental conditions                    | For other ambient conditions: see "S7-200 Programmable Controller, System Manual"  | For other ambient conditions: see "S7-200 Programmable Controller, System Manual"  | For other ambient conditions: see "S7-200 Programmable Controller, System Manual"  | For other ambient conditions: see "S7-200 Programmable Controller, System Manual"  |
| Operating temperature                        |  |  |  |  |
| - vertical mounting, min.                    | 0 °C   | 0 °C   | 0 °C   | 0 °C   |
| - vertical mounting, max.                    | 45 °C  | 45 °C  | 45 °C  | 45 °C  |
| - horizontal mounting, min.                  | 0 °C   | 0 °C   | 0 °C   | 0 °C   |
| - horizontal mounting, max.                  | 55 °C  | 55 °C  | 55 °C  | 55 °C  |
| Air pressure                                 |  |  |  |  |
| - permissible range, min                     | 860 hPa  | 860 hPa  | 860 hPa  | 860 hPa  |
| - permissible range, max                     | 1,080 hPa  | 1,080 hPa  | 1,080 hPa  | 1,080 hPa  |
| Relative humidity                            |  |  |  |  |
| - Operation, min.                            | 5 %  | 5 %  | 5 %  | 5 %  |
| - Operation, max.                            | 95 %; RH stressing level 2 in accordance with IEC 1131-2   | 95 %; RH stressing level 2 in accordance with IEC 1131-2   | 95 %; RH stressing level 2 in accordance with IEC 1131-2   | 95 %; RH stressing level 2 in accordance with IEC 1131-2   |
| Degree of protection and class of protection |  |  |  |  |
| - IP 20                                      | Yes  | Yes  | Yes  | Yes  |
| <b>Dimensions and weight</b>                 |  |  |  |  |
| •Weight, approx.                             | 270 g  | 310 g  | 270 g  | 310 g  |
| •Width                                       | 90 mm  | 90 mm  | 90 mm  | 90 mm  |
| •Height                                      | 80 mm  | 80 mm  | 80 mm  | 80 mm  |
| •Depth                                       | 62 mm  | 62 mm  | 62 mm  | 62 mm  |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

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### Technical specifications (continued)

|  | 6ES7 214-1AD23-0XB0   | 6ES7 214-1BD23-0XB0  | 6ES7 214-2AD23-0XB0   | 6ES7 214-2BD23-0XB0  | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0   |
|--|---|--|---|--|---|---|
| <b>Supply voltages</b>                     |   |  |   |  |   |   |
| Rated value                                |   |  |   |  |   |   |
| - 24 V DC                                  | Yes   |  | Yes   |  | Yes   |   |
| - permissible range, lower limit (DC)      | 20.4 V  |  | 20.4 V  |  | 20.4 V  |   |
| - permissible range, upper limit (DC)      | 28.8 V  |  | 28.8 V  |  | 28.8 V  |   |
| - 120 V AC                                 |   | Yes  |   | Yes  |   | Yes   |
| - 230 V AC                                 |   | Yes  |   | Yes  |   | Yes   |
| - permissible range, lower limit (AC)      |   | 85 V   |   | 85 V   |   | 85 V  |
| - permissible range, upper limit (AC)      |   | 264 V  |   | 264 V  |   | 264 V   |
| - permissible frequency range, lower limit |   | 47 Hz  |   | 47 Hz  |   | 47 Hz   |
| - permissible frequency range, upper limit |   | 63 Hz  |   | 63 Hz  |   | 63 Hz   |
| <b>Voltages and currents</b>               |   |  |   |  |   |   |
| Load voltage L+                            |   |  |   |  |   |   |
| - Rated value (DC)                         | 24 V  | 24 V   | 24 V  | 24 V   | 24 V  | 24 V  |
| - permissible range, lower limit (DC)      | 20.4 V  | 5 V  | 20.4 V  | 5 V  | 20.4 V  | 5 V   |
| - permissible range, upper limit (DC)      | 28.8 V  | 30 V   | 28.8 V  | 30 V   | 28.8 V  | 30 V  |
| Load voltage L1                            |   |  |   |  |   |   |
| - Rated value (AC)                         |   | 100 V; 100 to 230 V AC   |   | 100 V; 100 to 230 V AC   |   | 100 V; 100 to 230 V AC  |
| - permissible range, lower limit (AC)      |   | 5 V  |   | 5 V  |   | 5 V   |
| - permissible range, upper limit (AC)      |   | 250 V  |   | 250 V  |   | 250 V   |
| - permissible frequency range, lower limit |   | 47 Hz  |   | 47 Hz  |   | 47 Hz   |
| - permissible frequency range, upper limit |   | 63 Hz  |   | 63 Hz  |   | 63 Hz   |
| <b>Current consumption</b>                 |   |  |   |  |   |   |
| • Inrush current, max.                     | 12 A; at 28.8 V   | 20 A; at 264 V   | 12 A; at 28.8 V   | 20 A; at 264 V   | 10 A; at 28.8 V   | 20 A; at 264 V  |
| • from supply voltage L+, max.             | 700 mA; 110 to 700 mA, output current for expansion modules (5 V DC) 660 mA |  | 900 mA; 120 to 900 mA, output current for expansion modules (5 V DC) 660 mA |  | 1,050 mA; 150 to 1050 mA, output current for expansion modules (5 V DC) 1000 mA |   |
| • from supply voltage L1, max.             |   | 200 mA; 30 to 100 mA (240 V), 60 to 200 mA (120 V); output current for expansion modules (5 V DC) 600 mA |   | 220 mA; 35 to 100 mA (240 V), 70 to 220 mA (120 V); output current for expansion modules (5 V DC) 600 mA |   | 320 mA; 40 to 160 mA (240 V), 80 to 320 mA (120 V); output current for expansion modules (5 V DC) 1000 mA |
| back-up battery                            |   |  |   |  |   |   |
| - Backup time                              | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module   | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module                                | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module   | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module                                | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module       | 100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module                                 |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

### Technical specifications (continued)

|  | 6ES7 214-1AD23-0XB0  | 6ES7 214-1BD23-0XB0  | 6ES7 214-2AD23-0XB0  | 6ES7 214-2BD23-0XB0  | 6ES7 216-2AD23-0XB0  | 6ES7 216-2BD23-0XB0  |
|--|--|--|--|--|--|--|
| <b>Memory/backup</b>                                       |  |  |  |  |  |  |
| Memory   |  |  |  |  |  |  |
| - Number of memory modules (optional)                      | 1; pluggable memory module, content identical to integral EEPROM, in addition, recipes, data logs and other files can be saved.  | 1; pluggable memory module, content identical to integral EEPROM, in addition, recipes, data logs and other files can be saved.  | 1; pluggable memory module, content identical to integral EEPROM, in addition, recipes, data logs and other files can be saved.  | 1; pluggable memory module, content identical to integral EEPROM, in addition, recipes, data logs and other files can be saved.  | 1; pluggable memory module, content identical to integral EEPROM, in addition, recipes, data logs and other files can be saved.  | 1; pluggable memory module, content identical to integral EEPROM, in addition, recipes, data logs and other files can be saved.  |
| •Data memory and program memory                            |  |  |  |  |  |  |
| - Data memory, max.  | 8 KByte  | 8 KByte  | 10 KByte   | 10 KByte   | 10 KByte   | 10 KByte   |
| - Program memory, max.                                     | 12 KByte;<br>8 Kbytes for active run-time edit   | 12 KByte;<br>8 Kbytes for active run-time edit   | 16 KByte;<br>12 Kbytes for active run-time edit  | 16 KByte;<br>12 Kbytes for active run-time edit  | 24 KByte;<br>16 Kbytes with active run-time edit   | 24 KByte;<br>16 Kbytes with active run-time edit   |
| Backup   |  |  |  |  |  |  |
| - available  | Yes; Program: entire program maintenance-free in integral EEPROM, programmable via CPU; data: entire DB 1 loaded from PG/PC maintenance-free in integral EEPROM, current values of DB 1 in RAM, retentive flags, timers, counters etc., maintenance free via super capacitor; optional battery | Yes; Program: entire program maintenance-free in integral EEPROM, programmable via CPU; data: entire DB 1 loaded from PG/PC maintenance-free in integral EEPROM, current values of DB 1 in RAM, retentive flags, timers, counters etc., maintenance free via super capacitor; optional battery | Yes; Program: entire program maintenance-free in integral EEPROM, programmable via CPU; data: entire DB 1 loaded from PG/PC maintenance-free in integral EEPROM, current values of DB 1 in RAM, retentive flags, timers, counters etc., maintenance free via super capacitor; optional battery | Yes; Program: entire program maintenance-free in integral EEPROM, programmable via CPU; data: entire DB 1 loaded from PG/PC maintenance-free in integral EEPROM, current values of DB 1 in RAM, retentive flags, timers, counters etc., maintenance free via super capacitor; optional battery | Yes; Program: entire program maintenance-free in integral EEPROM, programmable via CPU; data: entire DB 1 loaded from PG/PC maintenance-free in integral EEPROM, current values of DB 1 in RAM, retentive flags, timers, counters etc., maintenance free via super capacitor; optional battery | Yes; Program: entire program maintenance-free in integral EEPROM, programmable via CPU; data: entire DB 1 loaded from PG/PC maintenance-free in integral EEPROM, current values of DB 1 in RAM, retentive flags, timers, counters etc., maintenance free via super capacitor; optional battery |
| <b>CPU/processing times</b>                                |  |  |  |  |  |  |
| •for bit instruction, max.                                 | 0.22 µs  | 0.22 µs  | 0.22 µs  | 0.22 µs  | 0.22 µs  | 0.22 µs  |
| <b>Timers/counters and their retentive characteristics</b> |  |  |  |  |  |  |
| S7 counter   |  |  |  |  |  |  |
| - Number   | 256  | 256  | 256  | 256  | 256  | 256  |
| •of which retentive with battery                           |  |  |  |  |  |  |
| - adjustable   | Yes; via super capacitor or battery  | Yes; via super capacitor or battery  | Yes; via super capacitor or battery  | Yes; via super capacitor or battery  | Yes; via super capacitor or battery  | Yes; via super capacitor or battery  |
| - lower limit  | 1  | 1  | 1  | 1  | 1  | 1  |
| - upper limit  | 256  | 256  | 256  | 256  | 256  | 256  |
| •Counting range  |  |  |  |  |  |  |
| - lower limit  | 0  | 0  | 0  | 0  | 0  | 0  |
| - upper limit  | 32,767   | 32,767   | 32,767   | 32,767   | 32,767   | 32,767   |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

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### Technical specifications (continued)

|   | 6ES7 214-1AD23-0XB0   | 6ES7 214-1BD23-0XB0   | 6ES7 214-2AD23-0XB0   | 6ES7 214-2BD23-0XB0   | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0   |
|---|---|---|---|---|---|---|
| S7 times  |   |   |   |   |   |   |
| - Number  | 256   | 256   | 256   | 256   | 256   | 256   |
| •of which retentive with battery                      |   |   |   |   |   |   |
| - adjustable  | Yes; via super capacitor or battery   | Yes; via super capacitor or battery   | Yes; via super capacitor or battery   | Yes; via super capacitor or battery   | Yes; via super capacitor or battery   | Yes; via super capacitor or battery   |
| - upper limit   | 64  | 64  | 64  | 64  | 64  | 64  |
| •Timing range   |   |   |   |   |   |   |
| - lower limit   | 1 ms  | 1 ms  | 1 ms  | 1 ms  | 1 ms  | 1 ms  |
| - upper limit   | 54 min; 4 times, 1 ms to 30 s<br>16 times, 10 ms to 5 min<br>236 times, 100 ms to 54 min  | 54 min; 4 times, 1 ms to 30 s<br>16 times, 10 ms to 5 min<br>236 times, 100 ms to 54 min  | 54 min; 4 times, 1 ms to 30 s<br>16 times, 10 ms to 5 min<br>236 times, 100 ms to 54 min  | 54 min; 4 times, 1 ms to 30 s<br>16 times, 10 ms to 5 min<br>236 times, 100 ms to 54 min  | 54 min; 4 times, 1 ms to 30 s<br>16 times, 10 ms to 5 min<br>236 times, 100 ms to 54 min  | 54 min; 4 times, 1 ms to 30 s<br>16 times, 10 ms to 5 min<br>236 times, 100 ms to 54 min  |
| <b>Data areas and their retentive characteristics</b> |   |   |   |   |   |   |
| Flags   |   |   |   |   |   |   |
| - Number  | 32 Byte   | 32 Byte   | 32 Byte   | 32 Byte   | 32 Byte   | 32 Byte   |
| - adjustable retentivity                              | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  | Yes; M0.0 to M31.7  |
| - of which retentive with battery                     | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  | 0 to 255, via super capacitor or battery, adjustable  |
| - of which retentive without battery                  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  | 0 to 112 in EEPROM, adjustable  |
| <b>Configuration</b>                                  |   |   |   |   |   |   |
| •Connectable programming devices/PCs                  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  | SIMATIC PG/PC, Standard PC  |
| •Central units/expansion units, max.                  | 7 expansion modules. Only expansion modules of the S7-22x series can be used. (Because of the limited output current, the use of expansion modules may be subject to restrictions.) | 7 expansion modules. Only expansion modules of the S7-22x series can be used. (Because of the limited output current, the use of expansion modules may be subject to restrictions.) | 7 expansion modules. Only expansion modules of the S7-22x series can be used. (Because of the limited output current, the use of expansion modules may be subject to restrictions.) | 7 expansion modules. Only expansion modules of the S7-22x series can be used. (Because of the limited output current, the use of expansion modules may be subject to restrictions.) | 7 expansion modules. Only expansion modules of the S7-22x series can be used. (Because of the limited output current, the use of expansion modules may be subject to restrictions.) | 7 expansion modules. Only expansion modules of the S7-22x series can be used. (Because of the limited output current, the use of expansion modules may be subject to restrictions.) |
| I/O expansions  |   |   |   |   |   |   |
| - Analog inputs/outputs, max.                         | 35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)  | 35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)  | 38; 2 on board inputs and one output, in addition max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)  | 38; 2 on board inputs and one output, in addition max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)  | 35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)  | 35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)  |
| - Digital inputs/outputs, max.                        | 168; max. 94 inputs and 74 outputs (CPU+EM)   | 168; max. 94 inputs and 74 outputs (CPU+EM)   | 168; max. 94 inputs and 74 outputs (CPU+EM)   | 168; max. 94 inputs and 74 outputs (CPU+EM)   | 148; max. 128 inputs and 120 outputs (CPU+EM)   | 148; max. 128 inputs and 120 outputs (CPU+EM)   |
| - AS interface inputs/outputs, max.                   | 62; AS interface A/B slaves (CP 243-2)  | 62; AS interface A/B slaves (CP 243-2)  | 62; AS interface A/B slaves (CP 243-2)  | 62; AS interface A/B slaves (CP 243-2)  | 62; AS interface A/B slaves (CP 243-2)  | 62; AS interface A/B slaves (CP 243-2)  |

# SIMATIC S7-200

## Central processing units

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### Technical specifications (continued)

|                            | 6ES7 214-1AD23-0XB0   | 6ES7 214-1BD23-0XB0   | 6ES7 214-2AD23-0XB0   | 6ES7 214-2BD23-0XB0   | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0   |
|----------------------------|---|---|---|---|---|---|
| <b>Connection system</b>   |   |   |   |   |   |   |
| •Pluggable I/O terminals   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| <b>1st interface</b>       |   |   |   |   |   |   |
| •Type of interface         | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   |
| •Physical                  | RS 485  | RS 485  | RS 485  | RS 485  | RS 485  | RS 485  |
| Functionality              |   |   |   |   |   |   |
| - MPI                      | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   |
| - PPI                      | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   |
| - Serial data transmission | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter |
| MPI                        |   |   |   |   |   |   |
| - Transmission rates, max. | 187.5 kBit/s  | 187.5 kBit/s  | 187.5 kBit/s  | 187.5 kBit/s  | 187.5 kBit/s  | 187.5 kBit/s  |
| - Transmission rates, min. | 19.2 kBit/s   | 19.2 kBit/s   | 19.2 kBit/s   | 19.2 kBit/s   | 19.2 kBit/s   | 19.2 kBit/s   |

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

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### Technical specifications (continued)

|                            | 6ES7 214-1AD23-0XB0 | 6ES7 214-1BD23-0XB0 | 6ES7 214-2AD23-0XB0   | 6ES7 214-2BD23-0XB0   | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0   |
|----------------------------|---------------------|---------------------|---|---|---|---|
| <b>2nd interface</b>       |                     |                     |   |   |   |   |
| •Type of interface         |                     |                     | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   | integrated RS 485 interface   |
| •Physical                  |                     |                     | RS 485  | RS 485  | RS 485  | RS 485  |
| Functionality              |                     |                     |   |   |   |   |
| - MPI                      |                     |                     | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   | Yes; as MPI Slave for data exchange with MPI Masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); internal S7-200 CPU/CPU communication is limited in the MPI network; transmission rates 19.2/187.5 kbit/s   |
| - PPI                      |                     |                     | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   | Yes; with PPI protocol for programming functions, HMI functions (TD 200, OP), S7-200 internal CPU/CPU communication; transmission rates 9.6/19.2/187.5 kbit/s   |
| - Serial data transmission |                     |                     | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter | Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter |
| MPI                        |                     |                     |   |   |   |   |
| - Transmission rate, max.  |                     |                     | 187.5 kBit/s  | 187.5 kBit/s  | 187.5 kBit/s  | 187.5 kBit/s  |
| - Transmission rate, min.  |                     |                     | 19.2 kBit/s   | 19.2 kBit/s   | 19.2 kBit/s   | 19.2 kBit/s   |



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## Central processing units

CPU 221, 222, 224, 224 XP, 226

### Technical specifications (continued)

|  | 6ES7 214-1AD23-0XB0  | 6ES7 214-1BD23-0XB0  | 6ES7 214-2AD23-0XB0  | 6ES7 214-2BD23-0XB0  | 6ES7 216-2AD23-0XB0  | 6ES7 216-2BD23-0XB0  |
|--|--|--|--|--|--|--|
| <b>CPU/ programming</b>                      |  |  |  |  |  |  |
| Programming language                         |  |  |  |  |  |  |
| - LAD  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
| - FBD  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
| - STL  | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  |
| •Instruction set                             | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions | Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions |
| •User program protection/password protection | Yes; 3-stage password protection   | Yes; 3-stage password protection   | Yes; 3-stage password protection   | Yes; 3-stage password protection   | Yes; 3-stage password protection   | Yes; 3-stage password protection   |
| •Program execution                           | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   | free cycle (OB 1), interrupt-driven, time-driven (1 to 255 ms)   |
| •Program organization                        | 1 OB, 1 DB, 1 SDB subprograms with/without parameter transfer  | 1 OB, 1 DB, 1 SDB subprograms with/without parameter transfer  | 1 OB, 1 DB, 1 SDB subprograms with/without parameter transfer  | 1 OB, 1 DB, 1 SDB subprograms with/without parameter transfer  | 1 OB, 1 DB, 1 SDB subprograms with/without parameter transfer  | 1 OB, 1 DB, 1 SDB subprograms with/without parameter transfer  |
| •Number of sub-programs, max.                | 64   | 64   | 64   | 64   | 64   | 64   |
| <b>Digital inputs</b>                        |  |  |  |  |  |  |
| •Number of digital inputs                    | 14   | 14   | 14   | 14   | 24   | 24   |
| Length of cable                              |  |  |  |  |  |  |
| - Length of cable shielded, max              | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  | 500 m; Standard input: 500m, fast counters: 50m  |
| - Length of cable unshielded, max            | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  | 300 m; not for high-speed signals  |
| •m/p reading                                 | Yes; optional, per group   | Yes; optional, per group   | Yes; optional, per group   | Yes; optional, per group   | Yes; optional, per group   | Yes; optional, per group   |
| Input voltage                                |  |  |  |  |  |  |
| - Rated value, DC                            | 24 V   | 24 V   | 24 V   | 24 V   | 24 V   | 24 V   |
| - for signal "0"                             | 0 to 5 V   | 0 to 5 V   | 0 to 5 V; 0 to 1V (I0.3 to I0.5)   | 0 to 5 V0 to 1V (I0.3 to I0.5)   | 0 to 5 V   | 0 to 5 V   |
| - for signal "1"                             | min. 15 V  | min. 15 V  | min. 15 V; at least 4V (I0.3 to I0.5)  | min. 15 V; at least 4V (I0.3 to I0.5)  | min. 15 V  | min. 15 V  |
| Input current                                |  |  |  |  |  |  |
| - for 1 signal, typical                      | 2.5 mA   | 2.5 mA   | 2.5 mA; 8 mA for I0.3 to I0.5  | 2.5 mA; 8 mA for I0.3 to I0.5  | 2.5 mA   | 2.5 mA   |

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## Central processing units

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### Technical specifications (continued)

|   | 6ES7 214-1AD23-0XB0   | 6ES7 214-1BD23-0XB0           | 6ES7 214-2AD23-0XB0   | 6ES7 214-2BD23-0XB0                  | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0           |
|---|---|-------------------------------|---|--------------------------------------|---|-------------------------------|
| Input delay (at rated value of the input voltage)         |   |                               |   |                                      |   |                               |
| •For standard inputs                                      |   |                               |   |                                      |   |                               |
| - Parameterizable   | Yes; all  | Yes; all                      | Yes; all  | Yes; all                             | Yes; all  | Yes; all                      |
| - at 0 after 1, min.                                      | 0.2 ms  | 0.2 ms                        | 0.2 ms  | 0.2 ms                               | 0.2 ms  | 0.2 ms                        |
| - at 0 after 1, max.                                      | 12.8 ms   | 12.8 ms                       | 12.8 ms   | 12.8 ms                              | 12.8 ms   | 12.8 ms                       |
| •for alarm inputs   |   |                               |   |                                      |   |                               |
| - parameterizable   | Yes; I0.0 to I0.3   | Yes; I0.0 to I0.3             | Yes; I0.0 to I0.3   | Yes; I0.0 to I0.3                    | Yes; I0.0 to I0.3   | Yes; I0.0 to I0.3             |
| •for counters/technological functions                     |   |                               |   |                                      |   |                               |
| - parameterizable   | Yes; (E0.0 to E1.5)<br>30 kHz   | Yes; (E0.0 to E1.5)<br>30 kHz | Yes; (E0.0 to E1.5)<br>up to 200 kHz  | Yes; (E0.0 to E1.5)<br>up to 200 kHz | Yes; (E0.0 to E1.5)<br>30 kHz   | Yes; (E0.0 to E1.5)<br>30 kHz |
| <b>Digital outputs</b>                                    |   |                               |   |                                      |   |                               |
| •Number of digital outputs                                | 10; Transistor  | 10; Relay                     | 10; Transistor  | 10; Relay                            | 16; Transistor  | 16; Relay                     |
| •Length of cable shielded, max.                           | 500 m   | 500 m                         | 500 m   | 500 m                                | 500 m   | 500 m                         |
| •Length of cable unshielded, max.                         | 150 m   | 150 m                         | 150 m   | 150 m                                | 150 m   | 150 m                         |
| •Short-circuit protection of the output                   | No; provided externally   | No; provided externally       | No; provided externally   | No; provided externally              | No; provided externally   | No; provided externally       |
| •Limitation of voltage induced on circuit interruption to | 1 W   |                               | 1 W   |                                      | 1 W   |                               |
| Switching capacity of the outputs                         |   |                               |   |                                      |   |                               |
| - at resistive load, max.                                 | 0.75 A  | 2 A                           | 0.75 A  | 2 A                                  | 0.75 A  | 2 A                           |
| - at lamp load, max.                                      | 5 W   | 200 W; 30 W DC, 200 W AC      | 5 W   | 200 W; 30 W DC, 200 W AC             | 5 W   | 200 W; 30 W DC, 200 W AC      |
| Output voltage  |   |                               |   |                                      |   |                               |
| - for 1 signal  | 20 V DC   | L+/L1                         | L+ minus 0.4V (5V/20.4V for A0.0 to A0.4; 20.4V A0.5 to A1.1)   | L+/L1                                | 20 V DC   | L+/L1                         |
| Output current  |   |                               |   |                                      |   |                               |
| - for 1 signal rated value                                | 750 mA  | 2 A                           | 750 mA  | 2 A                                  | 750 mA  | 2 A                           |
| - for 0 signal residual current, max.                     | 10 µA   | 0 mA                          | 10 µA   | 0 mA                                 | 10 µA   | 0 mA                          |
| Output delay at resistive load                            |   |                               |   |                                      |   |                               |
| - "0" after "1", max.                                     | 15 µs; of the standard outputs, max. (A0.2 to A1.1) 2 µs; of the pulse outputs, max. (A0.0 to A0.1) 2 µs    | 10 ms; all outputs            | 15 µs; of the standard outputs, max. (A0.2 to A1.1) 15 µs; of the pulse outputs, max. (A0.0 to A0.1) 0.5 µs   | 10 ms; all outputs                   | 15 µs; of the standard outputs, max. (A0.2 to A1.1) 2 µs; of the pulse outputs, max. (A0.0 to A0.1) 2 µs    | 10 ms; all outputs            |
| - "1" after "0", max.                                     | 130 µs; of the standard outputs, max. (A0.2 to A1.1) 10 µs; of the pulse outputs, max. (A0.0 to A0.1) 10 µs | 10 ms; all outputs            | 130 µs; of the standard outputs, max. (A0.2 to A1.1) 130 µs; of the pulse outputs, max. (A0.0 to A0.1) 1.5 µs | 10 ms; all outputs                   | 130 µs; of the standard outputs, max. (A0.2 to A1.1) 10 µs; of the pulse outputs, max. (A0.0 to A0.1) 10 µs | 10 ms; all outputs            |
| Parallel switching of 2 outputs                           |   |                               |   |                                      |   |                               |
| - to increase power                                       | Yes   | No                            | Yes   | No                                   | Yes   | No                            |
| Switching frequency                                       |   |                               |   |                                      |   |                               |
| - of pulse outputs, at resistive load, max.               | 20 kHz; A0.0 to A0.1  | 1 Hz                          | 100 kHz; A0.0 to A0.1   | 1 Hz                                 | 20 kHz; A0.0 to A0.1  | 1 kHz                         |
| Summation current of the outputs (per group)              |   |                               |   |                                      |   |                               |
| - up to 40 °C, max.                                       | 6 A   | 10 A                          | 3.75 A  | 10 A                                 | 6 A   | 10 A                          |
| - horizontal installation, up to 55 °C, max.              | 6 A   | 10 A                          | 3.75 A  | 10 A                                 | 6 A   | 10 A                          |

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## Central processing units

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### Technical specifications (continued)

|   | 6ES7 214-1AD23-0XB0   | 6ES7 214-1BD23-0XB0   | 6ES7 214-2AD23-0XB0  | 6ES7 214-2BD23-0XB0  | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0   |
|---|---|---|--|--|---|---|
| <b>Relay outputs</b>                                      |   |   |  |  |   |   |
| •Number of operating cycles                               |   | 10,000,000; mechanical 10 million, at rated load voltage 100,000  |  | 10,000,000; mechanical 10 million, at rated load voltage 100,000   |   | 10,000,000; mechanical 10 million, at rated load voltage 100,000  |
| <b>Analog inputs</b>                                      |   |   |  |  |   |   |
| •Number of analog potentiometers                          | 2; Analog potentiometer; resolution 8 bits  | 2; Analog potentiometer; resolution 8 bits  | 2; Analog potentiometer; resolution 8 bits   | 2; Analog potentiometer; resolution 8 bits   | 2; Analog potentiometer; resolution 8 bits  | 2; Analog potentiometer; resolution 8 bits  |
| <b>Sensor supply</b>                                      |   |   |  |  |   |   |
| 24 V - sensor supply                                      |   |   |  |  |   |   |
| - 24 V  | Yes; permissible range: 15.4 to 28.8 V  | Yes; permissible range: 20.4 to 28.8 V  | Yes; permissible range: 15.4 to 28.8 V   | Yes; permissible range: 20.4 to 28.8 V   | Yes; permissible range: 15.4 to 28.8 V  | Yes; permissible range: 20.4 to 28.8 V  |
| - Short-circuit protection                                | Yes; electronic at 280 mA   | Yes; electronic at 280 mA   | Yes; electronic at 280 mA  | Yes; electronic at 280 mA  | Yes; electronic at 400 mA   | Yes; electronic at 400mA  |
| - Output current, max.                                    | 280 mA  | 280 mA  | 280 mA   | 280 mA   | 400 mA  | 400 mA  |
| <b>Sensor</b>   |   |   |  |  |   |   |
| Connectable encoders                                      |   |   |  |  |   |   |
| - 2-wire BEROs  | Yes   | Yes   | Yes  | Yes  | Yes   | Yes   |
| - permissible closed-circuit current (2-wire BEROs), max. | 1 mA  | 1 mA  | 1 mA   | 1 mA   | 1 mA  | 1 mA  |
| <b>Integral functions</b>                                 |   |   |  |  |   |   |
| •Number of counters                                       | 6; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 4 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the setpoint value is reached; change of count direction etc. | 6; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 4 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the setpoint value is reached; change of count direction etc. | 6; fast counters (2 to 200 kHz and 4 to 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the setpoint value is reached; change of count direction etc. | 6; fast counters (2 to 200 kHz and 4 to 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the setpoint value is reached; change of count direction etc. | 6; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 4 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the setpoint value is reached; change of count direction etc. | 6; fast counters (each 30 kHz), 32 bits (incl. sign), usable as up/down counter or for connecting 4 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counter)); parameterizable enable and reset input; interrupt options (incl. Call up a sub-program with any content) when the setpoint value is reached; change of count direction etc. |
| •Count frequency (counters) max.                          | 30 kHz  | 30 kHz  | 200 kHz  | 200 kHz  | 30 kHz  | 30 kHz  |
| •Number of alarm inputs                                   | 4; 4 rising edges and/or 4 falling edges  | 4; 4 rising edges and/or 4 falling edges  | 4; 4 rising edges and/or 4 falling edges   | 4; 4 rising edges and/or 4 falling edges   | 4; 4 rising edges and/or 4 falling edges  | 4; 4 rising edges and/or 4 falling edges  |
| •Number of pulse outputs                                  | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation  | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation  | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation   | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation   | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation  | 2; fast outputs, 20 kHz, with interrupt option; pulse width and frequency modulation  |
| •Cut-off frequency (pulse)                                | 20 kHz  | 20 kHz  | 20 kHz   | 20 kHz   | 20 kHz  | 20 kHz  |

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## Central processing units

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### Technical specifications (continued)

|  | 6ES7 214-1AD23-0XB0   | 6ES7 214-1BD23-0XB0   | 6ES7 214-2AD23-0XB0   | 6ES7 214-2BD23-0XB0   | 6ES7 216-2AD23-0XB0   | 6ES7 216-2BD23-0XB0   |
|--|---|---|---|---|---|---|
| <b>Potentials/ electrical isolation</b>      |   |   |   |   |   |   |
| Digital output functions                     |   |   |   |   |   |   |
| - between the channels                       | Yes;<br>Optocoupler   | Yes; Relay  | Yes;<br>Optocoupler   | Yes; Relay  | Yes;<br>Optocoupler   | Yes; Relay  |
| - between the channels, in groups of         | 5   | 3, 3 and 4  | 5   | 3, 3 and 4  | 8 and 8   | 4, 5 and 7  |
| Digital input functions                      |   |   |   |   |   |   |
| - between the channels                       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes;<br>Optocoupler   |
| - between the channels, in groups of         | 6 and 8   | 6 and 8   | 6 and 8   | 6 and 8   | 13 and 11   | 13 and 11   |
| <b>Permissible potential difference</b>      |   |   |   |   |   |   |
| •between different circuits                  | 500 V DC between 24 V DC and 5 V DC   | 500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC       | 500 V DC between 24 V DC and 5 V DC   | 500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC       | 500 V DC between 24 V DC and 5 V DC   | 500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC       |
| <b>Environmental requirements</b>            |   |   |   |   |   |   |
| •Environmental conditions                    | For other ambient conditions: see "S7-200 Programmable Controller, System Manual" | For other ambient conditions: see "S7-200 Programmable Controller, System Manual" | For other ambient conditions: see "S7-200 Programmable Controller, System Manual" | For other ambient conditions: see "S7-200 Programmable Controller, System Manual" | For other ambient conditions: see "S7-200 Programmable Controller, System Manual" | For other ambient conditions: see "S7-200 Programmable Controller, System Manual" |
| Operating temperature                        |   |   |   |   |   |   |
| - vertical mounting, min.                    | 0 °C  | 0 °C  | 0 °C  | 0 °C  | 0 °C  | 0 °C  |
| - vertical mounting, max.                    | 45 °C   | 45 °C   | 45 °C   | 45 °C   | 45 °C   | 45 °C   |
| - horizontal mounting, min.                  | 0 °C  | 0 °C  | 0 °C  | 0 °C  | 0 °C  | 0 °C  |
| - horizontal mounting, max.                  | 55 °C   | 55 °C   | 55 °C   | 55 °C   | 55 °C   | 55 °C   |
| Air pressure                                 |   |   |   |   |   |   |
| - permissible range, min                     | 860 hPa   | 860 hPa   | 860 hPa   | 860 hPa   | 860 hPa   | 860 hPa   |
| - permissible range, max                     | 1,080 hPa   | 1,080 hPa   | 1,080 hPa   | 1,080 hPa   | 1,080 hPa   | 1,080 hPa   |
| Relative humidity                            |   |   |   |   |   |   |
| - Operation, min.                            | 5 %   | 5 %   | 5 %   | 5 %   | 5 %   | 5 %   |
| - Operation, max.                            | 95 %; RH stressing level 2 in accordance with IEC 1131-2                          | 95 %; RH stressing level 2 in accordance with IEC 1131-2                          | 95 %; RH stressing level 2 in accordance with IEC 1131-2                          | 95 %; RH stressing level 2 in accordance with IEC 1131-2                          | 95 %; RH stressing level 2 in accordance with IEC 1131-2                          | 95 %; RH stressing level 2 in accordance with IEC 1131-2                          |
| Degree of protection and class of protection |   |   |   |   |   |   |
| - IP 20                                      | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| <b>Dimensions and weight</b>                 |   |   |   |   |   |   |
| •Weight, approx.                             | 360 g   | 410 g   | 390 g   | 440 g   | 550 g   | 660 g   |
| •Width                                       | 120.5 mm  | 120.5 mm  | 140 mm  | 140 mm  | 196 mm  | 196 mm  |
| •Height                                      | 80 mm   | 80 mm   | 80 mm   | 80 mm   | 80 mm   | 80 mm   |
| •Depth                                       | 62 mm   | 62 mm   | 62 mm   | 62 mm   | 62 mm   | 62 mm   |

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## Central processing units

CPU 221, 222, 224, 224 XP, 226

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| Ordering Data  | Order No.                  | Ordering Data   | Order No.                  |
|--|----------------------------|---|----------------------------|
| <b>CPU 221</b><br>Compact CPU, 4 KB RAM, 24 V DC supply voltage, 6 DI/4 DO integrated <sup>A)</sup>  | <b>6ES7 211-0AA23-0XB0</b> | <b>S7-200 True Power Box</b><br>Complete package consisting of CPU 222, STEP 7 Micro/WIN V3, combined clock and battery modules, intelligent RS 232/PPI multimaster cable, manual; delivered in a practical box |                            |
| Compact CPU, 4 KB RAM, 100 to 230 V AC supply voltage, 6 DI/4 DO integrated, relay outputs <sup>A)</sup>   | <b>6ES7 211-0BA23-0XB0</b> |   |                            |
| <b>CPU 222</b><br>Compact CPU, expandable, 4 KB RAM, 24 V DC supply voltage, 8 DI/6 DO integrated <sup>A)</sup>  | <b>6ES7 212-1AB23-0XB0</b> | German <sup>C)</sup>  | <b>6ES7 298-0AA20-0AA2</b> |
| Compact CPU, expandable, 4 KB RAM, 100-230 V AC, 8 DI/6 DO integrated, relay outputs <sup>A)</sup>   | <b>6ES7 212-1BB23-0XB0</b> | English <sup>C)</sup>   | <b>6ES7 298-0AA20-0BA2</b> |
| <b>CPU 224</b><br>Compact CPU, expandable, 8/12 KB RAM for program, 8 KB RAM for data, 24 V DC supply voltage, 14 DI/10 DO, integrated <sup>A)</sup>                 | <b>6ES7 214-1AD23-0XB0</b> | French <sup>C)</sup>  | <b>6ES7 298-0AA20-0CA2</b> |
| Compact CPU, expandable, 8/12 KB RAM for program, 8 KB RAM for data, 100 - 230 V AC supply voltage, 14 DI/10 DO, integrated, relay outputs <sup>A)</sup>             | <b>6ES7 214-1BD23-0XB0</b> | Spanish <sup>C)</sup>   | <b>6ES7 298-0AA20-0DA2</b> |
| <b>CPU 224 XP</b><br>Compact CPU, expandable, 12/16 KB RAM for program, 10 KB RAM for data, 24 V DC supply voltage, 14 DI/10 DO/ 2 AI/1 AO integrated <sup>A)</sup>  | <b>6ES7 214-2AD23-0XB0</b> | Italian <sup>C)</sup>   | <b>6ES7 298-0AA20-0EA2</b> |
| Compact CPU, expandable, 12/16 KB RAM for program, 10 KB RAM for data, 100 - 230 V AC supply voltage, 14 DI/10 DO (relay outputs) 2 AI/1 AO integrated <sup>A)</sup> | <b>6ES7 214-2BD23-0XB0</b> | <b>Memory module MC 291, EEPROM <sup>A)</sup></b><br>for CPU 221/222/224/224 XP/226   | <b>6ES7 291-8GE20-0XA0</b> |
| <b>CPU 226</b><br>Compact CPU, expandable, 16/24 KB RAM for program, 10 KB RAM for data, 24 V DC supply voltage, 24 DI/16 DO, integrated <sup>A)</sup>               | <b>6ES7 216-2AD23-0XB0</b> | <b>Memory module MC 291, EEPROM</b><br>for CPU 221/222/224/224 XP/226   |                            |
| Compact CPU, expandable, 16/24 KB RAM for program, 10 KB RAM for data, 100 - 230 V AC supply voltage, 24 DI/16 DO, integrated, relay outputs <sup>A)</sup>           | <b>6ES7 216-2BD23-0XB0</b> | 64 KB <sup>A)</sup>   | <b>6ES7 291-8GF23-0XA0</b> |
|  |                            | 256 KB <sup>A)</sup>  | <b>6ES7 291-8GH23-0XA0</b> |
|  |                            | <b>Grounding terminal</b><br>10 items   | <b>6ES5 728-8MA11</b>      |
|  |                            | <b>Front flap set <sup>A)</sup></b><br>contains different covering flaps for CPU and EM; Spare part   | <b>6ES7 291-3AX20-0XA0</b> |
|  |                            | <b>SIM 274 simulator (optional)</b><br>with 8 connection terminals for CPU 221/222 <sup>A)</sup>  | <b>6ES7 274-1XF00-0XA0</b> |
|  |                            | with 14 connection terminals for CPU 224/224 XP <sup>A)</sup>   | <b>6ES7 274-1XH00-0XA0</b> |
|  |                            | with 24 connection terminals for CPU 226 <sup>A)</sup>  | <b>6ES7 274-1XK00-0XA0</b> |
|  |                            | <b>Terminal block for field wiring (optional)</b><br>for CPU 221/222, 10 items <sup>A)</sup>  | <b>6ES7 290-2AA00-0XA0</b> |
|  |                            | for CPU 224, 10 items <sup>A)</sup>   | <b>6ES7 290-2BA00-0XA0</b> |
|  |                            | <b>Plug-in terminal block (spare part)</b><br>with 12 connections (for CPU 22x) <sup>A)</sup>   | <b>6ES7 292-1AE20-0AA0</b> |
|  |                            | with 18 connections (for CPU 224) <sup>A)</sup>   | <b>6ES7 292-1AG20-0AA0</b> |
|  |                            | with 14 connection terminals (for CPU 226/226 XM) <sup>A)</sup>   | <b>6ES7 292-1AF20-0AA0</b> |
|  |                            | <b>Intelligent RS 232/PPI multimaster cable <sup>A)</sup></b><br>for connecting devices with an RS 232 interface to the SIMATIC S7-200 or PPI network; master in the multimaster PPI network                    | <b>6ES7 901-3CB30-0XA0</b> |
|  |                            | <b>Intelligent USB/PPI multimaster cable <sup>A)</sup></b><br>for connecting devices with an USB interface to the SIMATIC S7-200 or PPI network; master in the multimaster PPI network                          | <b>6ES7 901-3DB30-0XA0</b> |
|  |                            | <b>MPI cable</b><br>5 m for connecting the S7-200 to the MPI  | <b>6ES7 901-0BF00-0AA0</b> |

A) Subject to export regulations: AL: N and ECCN: EAR99H

C) Subject to export regulations: AL: N and ECCN: EAR99T

# SIMATIC S7-200

## Central processing units

CPU 221, 222, 224, 224 XP, 226

3

| Ordering Data   | Order No.  | Ordering Data  | Order No.  |
|---|--|--|--|
| <b>Backplane bus expansion cable</b> <sup>A)</sup><br>for connecting the two equipment tiers in a two-tier configuration, for CUP 222/224/224 XP/226  | <b>6ES7 290-6AA20-0XA0</b>   | <b>STEP 7 Micro/WIN V4 programming software</b><br><i>Target system:</i><br>All CPUs of the SIMATIC S7-200 range<br><i>Requirements:</i><br>Windows 2000/XP on PG or PC<br><i>delivery type:</i><br>English, German, French, Spanish, Italian, Chinese; with online documentation<br><br>Single license <sup>B)</sup><br>Upgrade single license <sup>1) B)</sup> | <b>6ES7 810-2CC03-0YX0</b><br><b>6ES7 810-2CC03-0YX3</b> |
| <b>Optional battery module</b> <sup>A)</sup>  | <b>6ES7 291-8BA20-0XA0</b>   | <b>PROFIBUS bus connector IP20 with 90° cable feeder</b><br>•without PG connection<br>•with PG connection  | <b>6ES7 972-0BA12-0XA0</b><br><b>6ES7 972-0BB12-0XA0</b> |
| <b>Optional combined clock and battery module</b> <sup>A)</sup><br>for CPU 221/222 only   | <b>6ES7 297-1AA23-0XA0</b>   | <b>PROFIBUS bus connector IP20 with 35° cable feeder</b><br>•without PG connection<br>•with PG connection  | <b>6ES7 972-0BA41-0XA0</b><br><b>6ES7 972-0BB41-0XA0</b> |
| <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4<br><br>German<br>English<br>French<br>Spanish<br>Italian<br>Chinese  | <b>6ES7 298-8FA24-8AH0</b><br><b>6ES7 298-8FA24-8BH0</b><br><b>6ES7 298-8FA24-8CH0</b><br><b>6ES7 298-8FA24-8DH0</b><br><b>6ES7 298-8FA24-8EH0</b><br><b>6ES7 298-8FA24-8FH0</b> | <b>PROFIBUS FC Standard Cable</b><br>for connecting to PPI; standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, up to 1000m, minimum order 20 m   | <b>6XV1 830-0EH10</b>                                    |
| <b>SIMATIC Manual Collection</b> <sup>B)</sup><br>Electronic manuals on CD-ROM, 5 languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering Software, Runtime Software, PCS 7, SIMATIC HMI, SIMATIC NET | <b>6ES7 998-8XC01-8YE0</b>   | <b>Repeater RS 485 for PROFIBUS</b>  | <b>6ES7 972-0AA01-0XA0</b>                               |
| <b>SIMATIC Manual Collection update service for 1 year</b> <sup>B)</sup><br>Up-to-date Manual Collection CD as well as the three subsequent updates   | <b>6ES7 998-8XC01-8YE2</b>   |  |  |

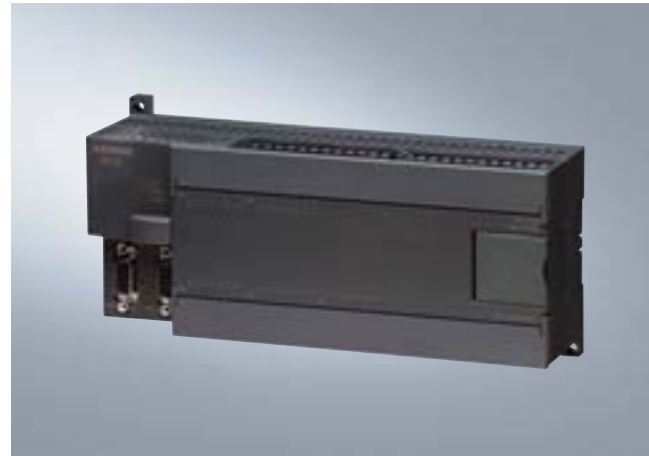
1) Upgrade for all previous STEP 7 Micro/WIN and STEP 7 Micro/DOS versions

A) Subject to export regulations: AL: N and ECCN: EAR99H

B) Subject to export regulations: AL: N and ECCN: EAR99S

Overview

3



- The SIPLUS S7-200 CPUs for use in the harshest environmental conditions
- With extended temperature range from -25 to +70°C
- Suitable for extraordinary medial load (pollution gas atmosphere)
- Occasional short-term condensation and increased mechanical loading permissible
- With the proven PLC technology of the S7-200
- Convenient handling, programming, maintenance and service
- The alternative to expensive custom solutions

More Information you can find at:

<http://www.siemens.com/siplus>



Overview



- Digital inputs/outputs to supplement the onboard I/Os of the CPUs
- For flexible adaptation of PLC to respective task
- For subsequent upgrading of the system with additional inputs  
Ordering Data

3

Technical specifications EM 221

|   | 6ES7 221-1BH22-0XA0 | 6ES7 221-1BF22-0XA0 | 6ES7 221-1EF22-0XA0               |
|---|---------------------|---------------------|-----------------------------------|
| <b>Current consumption</b>                                |                     |                     |                                   |
| •from backplane bus 5 V DC, max.                          | 70 mA               | 30 mA               | 30 mA                             |
| •Power dissipation, typical                               | 3 W                 | 2 W                 | 3 W                               |
| <b>Connection system</b>                                  |                     |                     |                                   |
| •Pluggable I/O terminals                                  | Yes                 | Yes                 | Yes                               |
| <b>Digital inputs</b>                                     |                     |                     |                                   |
| •Number of digital inputs                                 | 16                  | 8                   | 8                                 |
| Length of cable   |                     |                     |                                   |
| - Length of cable shielded, max                           | 500 m               | 500 m               | 500 m                             |
| - Length of cable unshielded, max                         | 300 m               | 300 m               | 300 m                             |
| •m/p reading  | Yes                 | Yes                 |                                   |
| •Input characteristic to comply with IEC 1131, Type 1     | Yes                 |                     | Yes                               |
| Input voltage   |                     |                     |                                   |
| - Rated value, AC   |                     |                     | 230 V; 220/230 V AC (47 to 63 Hz) |
| - Rated value, DC   | 24 V                | 24 V                |                                   |
| - for signal "0"  | 0 to 5 V            | 0 to 5 V            | to 20 V AC                        |
| - for signal "1"  | 15 to 30 V          | 15 to 30 V          | 79 V AC ( at 2.5 mA min.)         |
| Input current   |                     |                     |                                   |
| - for 1 signal, typical                                   | 4 mA                | 4 mA                | 2.5 mA                            |
| Input delay (at rated value of the input voltage)         |                     |                     |                                   |
| •For standard inputs                                      |                     |                     |                                   |
| - at 0 after 1, max.                                      | 4.5 ms              | 4.5 ms              | 15 ms                             |
| <b>Sensor</b>   |                     |                     |                                   |
| Connectable encoders                                      |                     |                     |                                   |
| - 2-wire BEROS  | Yes                 | Yes                 | Yes                               |
| - permissible closed-circuit current (2-wire BEROS), max. | 1 mA                | 1 mA                | 1 mA                              |
| <b>Potentials/ electrical isolation</b>                   |                     |                     |                                   |
| Digital input functions                                   |                     |                     |                                   |
| - Electrical isolation, digital input functions           | Yes; Optocoupler    | Yes; Optocoupler    | Yes; Optocoupler                  |
| - between the channels, in groups of                      | 4                   | 4                   | 1; (8 groups)                     |
| <b>Dimensions and weight</b>                              |                     |                     |                                   |
| •Weight, approx.  | 160 g               | 150 g               | 160 g                             |
| •Width  | 71.2 mm             | 46 mm               | 71.2 mm                           |
| •Height   | 80 mm               | 80 mm               | 80 mm                             |
| •Depth  | 62 mm               | 62 mm               | 62 mm                             |

#### Technical specifications EM 222

|   | 6ES7 222-1BD22-0XA0   | 6ES7 222-1BF22-0XA0   |
|---|---|---|
| <b>Voltages and currents</b>                              |   |   |
| Load voltage L+   |   |   |
| - Rated value (DC)  | 24 V  | 24 V  |
| - permissible range, lower limit (DC)                     | 20.4 V  | 20.4 V  |
| - permissible range, upper limit (DC)                     | 28.8 V  | 28.8 V  |
| <b>Current consumption</b>                                |   |   |
| Digital outputs   |   |   |
| •from backplane bus 5 V DC, max.                          | 40 mA   | 50 mA   |
| •Power dissipation, typical                               | 3 W   | 2 W   |
| <b>Connection system</b>                                  |   |   |
| •Pluggable I/O terminals                                  | Yes   | Yes   |
| <b>Digital outputs</b>                                    |   |   |
| •Number of digital outputs                                | 4   | 8   |
| •Length of cable shielded, max.                           | 500 m   | 500 m   |
| •Length of cable unshielded, max.                         | 150 m   | 150 m   |
| •Short-circuit protection of the output                   | No; provided externally (see manual package "Installing an S7-200") | No; provided externally (see manual package "Installing an S7-200") |
| •Limitation of voltage induced on circuit interruption to | L+ (-48 V)  | L+ (-48 V)  |
| <b>Output voltage</b>                                     |   |   |
| - for 1 signal  | 20 V DC   | 20 V  |
| <b>Output current</b>                                     |   |   |
| - for 1 signal permissible range for 0 to 55 °C, max.     | 5 A   | 750 mA  |
| - for 0 signal residual current, max.                     | 30 µA   | 10 µA   |
| <b>Parallel switching of 2 outputs</b>                    |   |   |
| - to increase power                                       |   | Yes   |
| <b>Summation current of the outputs (per group)</b>       |   |   |
| - up to 40 °C, max.                                       | 20 A  | 3 A   |
| - horizontal installation, up to 55 °C, max.              | 20 A  | 3 A   |
| - Maximum current per wire/group                          | 5 A   | 3 A   |
| <b>Relay outputs</b>                                      |   |   |
| Switching capacity of the contacts                        |   |   |
| - at inductive load, max.                                 | 5 A   | 0.75 A  |
| - at lamp load, max.                                      | 50 W  | 5 W   |
| - at resistive load, max.                                 | 5 A   | 0.75 A  |
| <b>Potentials/ electrical isolation</b>                   |   |   |
| Digital output functions                                  |   |   |
| - Electrical isolation, digital output functions          | Yes; Optocoupler  | Yes; Optocoupler  |
| - between the channels, in groups of                      | 1; 4 groups   | 4   |
| <b>Dimensions and weight</b>                              |   |   |
| •Weight, approx.  | 120 g   | 150 g   |
| •Width  | 45 mm   | 45 mm   |
| •Height   | 80 mm   | 80 mm   |
| •Depth  | 62 mm   | 62 mm   |

Technical specifications (continued)

|   | 6ES7 222-1HD22-0XA0   | 6ES7 222-1HF22-0XA0   | 6ES7 222-1EF22-0XA0   |
|---|---|---|---|
| <b>Voltages and currents</b>                              |   |   |   |
| Load voltage L+   |   |   |   |
| - Rated value (DC)  | 24 V  | 24 V  |   |
| - permissible range, lower limit (DC)                     | 12 V  | 5 V   |   |
| - permissible range, upper limit (DC)                     | 30 V  | 30 V  |   |
| Load voltage L1   |   |   |   |
| - Rated value (AC)  | 24 V; 24 to 230 V AC  | 24 V; 24 to 230 V AC  | 230 V; 220/230 V AC   |
| - permissible range, lower limit (AC)                     | 12 V  | 5 V   | 65 V  |
| - permissible range, upper limit (AC)                     | 250 V   | 250 V   | 264 V   |
| - permissible frequency range, lower limit                |   | 47 Hz   | 47 Hz   |
| - permissible frequency range, upper limit                |   | 63 Hz   | 63 Hz   |
| <b>Current consumption</b>                                |   |   |   |
| Digital outputs   |   |   |   |
| - from load voltage L+, max.                              | 80 mA; 20 mA per switched output                                    | 72 mA; 9 mA per switched output                                     |   |
| •from backplane bus 5 V DC, max.                          | 30 mA   | 40 mA   | 110 mA  |
| •Power dissipation, typical                               | 4 W   | 2 W   | 4 W   |
| <b>Connection system</b>                                  |   |   |   |
| •Pluggable I/O terminals                                  | Yes   | Yes   | Yes   |
| <b>Digital outputs</b>                                    |   |   |   |
| •Number of digital outputs                                | 4; Relay  | 8; Relay  | 8   |
| •Length of cable shielded, max.                           | 500 m   | 500 m   | 500 m   |
| •Length of cable unshielded, max.                         | 150 m   | 150 m   | 150 m   |
| •Short-circuit protection of the output                   | No; provided externally (see manual package "Installing an S7-200") | No; provided externally (see manual package "Installing an S7-200") | No; provided externally (see manual package "Installing an S7-200") |
| •Limitation of voltage induced on circuit interruption to | provided externally (see manual package "Installing an S7-200")     | provided externally (see manual package "Installing an S7-200")     | provided externally (see manual package "Installing an S7-200")     |
| Output voltage  |   |   |   |
| - for 1 signal  |   |   | L1 (-0.9 V)   |
| Output current  |   |   |   |
| - for 1 signal permissible range for 0 to 55 °C, max.     | 10 A  | 2 A   | 500 mA; AC  |
| - for 1 signal minimum load current                       |   |   | 50 mA   |
| - for 0 signal residual current, max.                     | 0 mA  | 0 mA  | 1.8 mA; at 264 V AC   |
| Summation current of the outputs (per group)              |   |   |   |
| - up to 40 °C, max.                                       | 40 mA   | 8 A   | 0.5 A   |
| - horizontal installation, up to 55 °C, max.              | 20 mA   | 8 A   | 0.5 A   |
| - Maximum current per wire/group                          | 10 A  | 8 A   | 0.5 A   |
| <b>Relay outputs</b>                                      |   |   |   |
| •Number of operating cycles                               | 30,000,000; mechanical 30 million, at rated load voltage 30,000     | 10,000,000; mechanical 10 million, at rated load voltage 100,000    |   |
| Switching capacity of the contacts                        |   |   |   |
| - at inductive load, max.                                 | 3 A; 2 A (DC), 3 A (AC)   | 2 A   | 0.5 A   |
| - at lamp load, max.                                      | 1,000 W; 100/1000 W (DC/AC)   | 200 W; 30/200 W (DC/AC)   | 60 W  |
| - at resistive load, max.                                 | 10 A  | 2 A   | 0.5 A   |

#### Technical specifications (continued)

|  | 6ES7 222-1HD22-0XA0 | 6ES7 222-1HF22-0XA0 | 6ES7 222-1EF22-0XA0 |
|--|---------------------|---------------------|---------------------|
| <b>Potentials/ electrical isolation</b>          |                     |                     |                     |
| Digital output functions                         |                     |                     |                     |
| - Electrical isolation, digital output functions | Yes; Relay          | Yes; Relay          | Yes; Optocoupler    |
| - between the channels, in groups of             | 1; 4 groups         | 4                   | 1; 8 groups         |
| <b>Dimensions and weight</b>                     |                     |                     |                     |
| •Weight, approx.                                 | 150 g               | 170 g               | 170 g               |
| •Width   | 45 mm               | 45 mm               | 71.2 mm             |
| •Height  | 80 mm               | 80 mm               | 80 mm               |
| •Depth   | 62 mm               | 62 mm               | 62 mm               |

#### Technical specifications EM 223

|   | 6ES7 223-1BF22-0XA0     | 6ES7 223-1BH22-0XA0     | 6ES7 223-1BL22-0XA0     |
|---|-------------------------|-------------------------|-------------------------|
| <b>Voltagages and currents</b>                            |                         |                         |                         |
| Load voltage L+   |                         |                         |                         |
| - Rated value (DC)  | 24 V                    | 24 V                    | 24 V                    |
| - permissible range, lower limit (DC)                     | 20.4 V                  | 20.4 V                  | 20.4 V                  |
| - permissible range, upper limit (DC)                     | 28.8 V                  | 28.8 V                  | 28.8 V                  |
| <b>Current consumption</b>                                |                         |                         |                         |
| •from backplane bus 5 V DC, max.                          | 40 mA                   | 80 mA                   | 160 mA                  |
| •Power dissipation, typical                               | 2 W                     | 3 W                     | 6 W                     |
| <b>Connection system</b>                                  |                         |                         |                         |
| •Pluggable I/O terminals                                  | Yes                     | Yes                     | Yes                     |
| <b>Digital inputs</b>                                     |                         |                         |                         |
| •Number of digital inputs                                 | 4                       | 8                       | 16                      |
| Input voltage   |                         |                         |                         |
| - Rated value, DC   | 24 V                    | 24 V                    | 24 V                    |
| - for signal "0"  | 0 to 5 V                | 0 to 5 V                | 0 to 5 V                |
| - for signal "1"  | 15 to 30 V DC           | 15 to 30 V DC           | 15 to 30 V DC           |
| Input current   |                         |                         |                         |
| - for 1 signal, typical                                   | 4 mA                    | 4 mA                    | 4 mA                    |
| Input delay (at rated value of the input voltage)         |                         |                         |                         |
| •For standard inputs                                      |                         |                         |                         |
| - at 0 after 1, max.                                      | 4.5 ms                  | 4.5 ms                  | 4.5 ms                  |
| <b>Digital outputs</b>                                    |                         |                         |                         |
| •Number of digital outputs                                | 4                       | 8                       | 16                      |
| •Length of cable shielded, max.                           | 500 m                   | 500 m                   | 500 m                   |
| •Length of cable unshielded, max.                         | 150 m                   | 150 m                   | 150 m                   |
| •Short-circuit protection of the output                   | No; provided externally | No; provided externally | No; provided externally |
| •Limitation of voltage induced on circuit interruption to | L+ (-48 V)              | L+ (-48 V)              | L+ (-48 V)              |
| Output voltage  |                         |                         |                         |
| - for 0 signal (DC), max.                                 | 0.1 V                   | 0.1 V                   | 0.1 V                   |
| - for 1 signal  | 20 V                    | 20 V                    | 20 V                    |
| Output current  |                         |                         |                         |
| - for 1 signal rated value                                | 750 mA                  | 750 mA                  | 750 mA                  |
| Summation current of the outputs (per group)              |                         |                         |                         |
| - Maximum current per wire/group                          | 3 A                     | 3 A                     | 3 A; 3/3/6              |

Technical specifications (continued)

|   | 6ES7 223-1BF22-0XA0             | 6ES7 223-1BH22-0XA0             | 6ES7 223-1BL22-0XA0             |
|---|---------------------------------|---------------------------------|---------------------------------|
| <b>Relay outputs</b>                                      |                                 |                                 |                                 |
| Switching capacity of the contacts                        |                                 |                                 |                                 |
| - at inductive load, max.                                 | 0.75 A; per output              | 0.75 A; per output              | 0.75 A; per output              |
| - at lamp load, max.                                      | 5 W                             | 5 W                             | 5 W                             |
| - at resistive load, max.                                 | 0.75 A; per output              | 0.75 A; per output              | 0.75 A; per output              |
| <b>Sensor</b>   |                                 |                                 |                                 |
| Connectable encoders                                      |                                 |                                 |                                 |
| - 2-wire BEROs  | Yes                             | Yes                             | Yes                             |
| - permissible closed-circuit current (2-wire BEROs), max. | 1 mA                            | 1 mA                            | 1 mA                            |
| <b>Insulation</b>   |                                 |                                 |                                 |
| •Insulation tested with                                   | 500 V AC                        | 500 V AC                        | 500 V AC                        |
| <b>Potentials/ electrical isolation</b>                   |                                 |                                 |                                 |
| Digital output functions                                  |                                 |                                 |                                 |
| - Electrical isolation, digital output functions          | Yes; Optocoupler                | Yes; Optocoupler                | Yes; Optocoupler                |
| - between the channels, in groups of                      | 4                               | 4                               | 4; 4 / 4 / 8                    |
| Digital input functions                                   |                                 |                                 |                                 |
| - Electrical isolation, digital input functions           | Yes; Optocoupler                | Yes; Optocoupler                | Yes; Optocoupler                |
| - between the channels, in groups of                      | 4                               | 4                               | 4                               |
| <b>Dimensions and weight</b>                              |                                 |                                 |                                 |
| •Weight, approx.  | 160 g                           | 200 g                           | 360 g                           |
| •Width  | 46 mm                           | 71.2 mm                         | 137.5 mm                        |
| •Height   | 80 mm                           | 80 mm                           | 80 mm                           |
| •Depth  | 62 mm                           | 62 mm                           | 62 mm                           |
| <b>Voltages and currents</b>                              |                                 |                                 |                                 |
| Load voltage L+   |                                 |                                 |                                 |
| - Rated value (DC)  | 24 V                            | 24 V                            | 24 V                            |
| - permissible range, lower limit (DC)                     | 5 V                             | 5 V                             | 5 V                             |
| - permissible range, upper limit (DC)                     | 30 V                            | 30 V                            | 30 V                            |
| Load voltage L1   |                                 |                                 |                                 |
| - Rated value (AC)  | 230 V; 24 to 230 V AC           | 230 V; 24 to 230 V AC           | 230 V; 24 to 230 V AC           |
| - permissible range, lower limit (AC)                     | 5 V                             | 5 V                             | 5 V                             |
| - permissible range, upper limit (AC)                     | 250 V                           | 250 V                           | 250 V                           |
| <b>Current consumption</b>                                |                                 |                                 |                                 |
| •from backplane bus 5 V DC, max.                          | 40 mA                           | 80 mA                           | 150 mA                          |
| •from coil current, max.                                  | 9 mA; per output for signal "1" | 9 mA; per output for signal "1" | 9 mA; per output for signal "1" |
| •from sensor current or ext. power supply (24 V DC), max. | 72 mA                           | 72 mA                           | 72 mA                           |
| •Power dissipation, typical                               | 2 W                             | 3 W                             | 6 W                             |
| <b>Connection system</b>                                  |                                 |                                 |                                 |
| •Pluggable I/O terminals                                  | Yes                             | Yes                             | Yes                             |
| <b>6ES7 223-1HF22-0XA0</b>                                |                                 |                                 |                                 |
| <b>6ES7 223-1PH22-0XA0</b>                                |                                 |                                 |                                 |
| <b>6ES7 223-1PL22-0XA0</b>                                |                                 |                                 |                                 |

#### Technical specifications (continued)

|  | 6ES7 223-1HF22-0XA0  | 6ES7 223-1PH22-0XA0  | 6ES7 223-1PL22-0XA0  |
|--|--|--|--|
| <b>Digital inputs</b>                                    |  |  |  |
| •Number of digital inputs                                | 4  | 8  | 16   |
| Input voltage  |  |  |  |
| - Rated value, DC  | 24 V   | 24 V   | 24 V   |
| - for signal "0"   | 0 to 5 V   | 0 to 5 V   | 0 to 5 V   |
| - for signal "1"   | 15 to 30 V DC  | 15 to 30 V DC  | 15 to 30 V DC  |
| Input current  |  |  |  |
| - for 1 signal, typical                                  | 4 mA   | 4 mA   | 4 mA   |
| Input delay (at rated value of the input voltage)        |  |  |  |
| •For standard inputs                                     |  |  |  |
| - at 0 after 1, max.                                     | 4.5 ms   | 4.5 ms   | 4.5 ms   |
| <b>Digital outputs</b>                                   |  |  |  |
| •Number of digital outputs                               | 4; Relay   | 8; Relay   | 16; Relay  |
| •Length of cable shielded, max.                          | 500 m  | 500 m  | 500 m  |
| •Length of cable unshielded, max.                        | 150 m  | 150 m  | 150 m  |
| •Short-circuit protection of the output                  | No; provided externally  | No; provided externally  | No; provided externally  |
| Output voltage   |  |  |  |
| - for 0 signal (DC), max.                                | 0.1 V; with 10 kOhm load   | 0.1 V; with 10 kOhm load   | 0.1 V; with 10 kOhm load   |
| - for 1 signal   | L+/L1  | L+/L1  | L+/L1  |
| Output current   |  |  |  |
| - for 1 signal rated value                               | 2,000 mA   | 2,000 mA   | 2,000 mA   |
| Summation current of the outputs (per group)             |  |  |  |
| - Maximum current per wire/group                         | 8 A  | 8 A  | 8 A  |
| <b>Relay outputs</b>                                     |  |  |  |
| •Number of operating cycles                              | 10,000,000; mechanical:<br>10 million, at rated load voltage:<br>100.000 | 10,000,000; mechanical:<br>10 million, at rated load voltage:<br>100.000 | 10,000,000; mechanical:<br>10 million, at rated load voltage:<br>100.000 |
| Switching capacity of the contacts                       |  |  |  |
| - at inductive load, max.                                | 0.75 A; per output   | 0.75 A; per output   | 0.75 A; per output   |
| - at lamp load, max.                                     | 200 W; 30/200 W (DC/AC)  | 200 W; 30/200 W (DC/AC)  | 200 W; 30/200 W (DC/AC)  |
| - at resistive load, max.                                | 0.75 A; per output   | 0.75 A; per output   | 0.75 A; per output   |
| <b>Sensor</b>  |  |  |  |
| Connectable encoders                                     |  |  |  |
| - 2-wire BERS  | Yes  | Yes  | Yes  |
| - permissible closed-circuit current (2-wire BERS), max. | 1 mA   | 1 mA   | 1 mA   |
| <b>Insulation</b>  |  |  |  |
| •Insulation tested with                                  | 500 V AC   | 500 V AC   | 500 V AC   |
| <b>Potentials/ electrical isolation</b>                  |  |  |  |
| Digital output functions                                 |  |  |  |
| - Electrical isolation, digital output functions         | Yes; Relay   | Yes; Relay   | Yes; Relay   |
| - between the channels, in groups of                     | 4  | 4  | 4  |
| Digital input functions                                  |  |  |  |
| - Electrical isolation, digital input functions          | Yes; Optocoupler   | Yes; Optocoupler   | Yes; Optocoupler   |
| - between the channels, in groups of                     | 4  | 4  | 8  |
| <b>Dimensions and weight</b>                             |  |  |  |
| •Weight, approx.   | 160 g  | 300 g  | 400 g  |
| •Width   | 46 mm  | 71.2 mm  | 137.5 mm   |
| •Height  | 80 mm  | 80 mm  | 80 mm  |
| •Depth   | 62 mm  | 62 mm  | 62 mm  |

# SIMATIC S7-200

## Digital modules

### Digital modules

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| Ordering Data   | Order No.                  |  | Order No.                  |
|---|----------------------------|--|----------------------------|
| <b>Digital input module EM 221</b><br>For CPU 221/222/224/224 XP/226  |                            | <b>Front flap set</b> <sup>A)</sup><br>contains different covering flaps for CPU and EM; Spare part            | <b>6ES7 291-3AX20-0XA0</b> |
| <ul style="list-style-type: none"> <li>• 8 inputs, 24 V DC, galvanically isolated, source/sink switching<sup>A)</sup></li> </ul>                    | <b>6ES7 221-1BF22-0XA0</b> | <b>Plug-in terminal block (spare part)</b>   |                            |
| <ul style="list-style-type: none"> <li>• 16 inputs, 24 V DC, galvanically isolated, source/sink switching<sup>A)</sup></li> </ul>                   | <b>6ES7 221-1BH22-0XA0</b> | <ul style="list-style-type: none"> <li>• with 7 connection terminals (for EM 221/222)<sup>A)</sup></li> </ul>  | <b>6ES7 292-1AD20-0AA0</b> |
| <ul style="list-style-type: none"> <li>• 8 inputs, 120/230 V AC, galvanically isolated, source/sink switching<sup>A)</sup></li> </ul>               | <b>6ES7 221-1EF22-0XA0</b> | <ul style="list-style-type: none"> <li>• with 12 connection terminals (for EM 223)<sup>A)</sup></li> </ul>     | <b>6ES7 292-1AE20-0AA0</b> |
| <b>Digital output module EM 222</b><br>For CPU 221/222/224/224 XP/226   |                            | <b>SIM 274 simulator (optional)</b> <sup>A)</sup><br>with 8 connection terminals for EM 221 and EM 223         | <b>6ES7 274-1XF00-0XA0</b> |
| <ul style="list-style-type: none"> <li>• 4 outputs, 24 V DC; 5 A, galvanically isolated<sup>A)</sup></li> </ul>                                     | <b>6ES7 222-1BD22-0XA0</b> | <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4 |                            |
| <ul style="list-style-type: none"> <li>• 8 outputs, 24 V DC; 0.75 A, galvanically isolated<sup>A)</sup></li> </ul>                                  | <b>6ES7 222-1BF22-0XA0</b> | German   | <b>6ES7 298-8FA24-8AH0</b> |
| <ul style="list-style-type: none"> <li>• 4 outputs, 24 V DC/24 V AC up to 230 V; 10 A, galvanically isolated, relay outputs<sup>A)</sup></li> </ul> | <b>6ES7 222-1HD22-0XA0</b> | English  | <b>6ES7 298-8FA24-8BH0</b> |
| <ul style="list-style-type: none"> <li>• 8 outputs, 24 V DC/24 V AC up to 230 V; 2 A, galvanically isolated, relay outputs<sup>A)</sup></li> </ul>  | <b>6ES7 222-1HF22-0XA0</b> | French   | <b>6ES7 298-8FA24-8CH0</b> |
| <ul style="list-style-type: none"> <li>• 8 outputs, AC 120/230 V; 0.5 A, galvanically isolated<sup>A)</sup></li> </ul>                              | <b>6ES7 222-1EF22-0XA0</b> | Spanish  | <b>6ES7 298-8FA24-8DH0</b> |
| <b>Digital input/output module EM 223</b><br>For CPU 221/222/224/224 XP/226   |                            | Italian  | <b>6ES7 298-8FA24-8EH0</b> |
| <ul style="list-style-type: none"> <li>• 4 inputs 24 V DC, 4 outputs 24 V DC; 0.75 A, galvanically isolated<sup>A)</sup></li> </ul>                 | <b>6ES7 223-1BF22-0XA0</b> | Chinese  | <b>6ES7 298-8FA24-8FH0</b> |
| <ul style="list-style-type: none"> <li>• 8 inputs 24 V DC, 8 outputs 24 V DC; 0.75 A, galvanically isolated<sup>A)</sup></li> </ul>                 | <b>6ES7 223-1BH22-0XA0</b> |  |                            |
| <ul style="list-style-type: none"> <li>• 16 inputs 24 V DC, 16 outputs 24 V DC; 0.75 A, galvanically isolated<sup>A)</sup></li> </ul>               | <b>6ES7 223-1BL22-0XA0</b> |  |                            |
| <ul style="list-style-type: none"> <li>• 4 inputs 24 V DC, 4 outputs, relay<sup>A)</sup></li> </ul>   | <b>6ES7 223-1HF22-0XA0</b> |  |                            |
| <ul style="list-style-type: none"> <li>• 8 inputs 24 V DC, 8 outputs, relay<sup>A)</sup></li> </ul>   | <b>6ES7 223-1PH22-0XA0</b> |  |                            |
| <ul style="list-style-type: none"> <li>• 16 inputs 24 V DC, 16 outputs, relay<sup>A)</sup></li> </ul>   | <b>6ES7 223-1PL22-0XA0</b> |  |                            |

A) Subject to export regulations: AL: N and ECCN: EAR99H



### Overview



- Digital inputs/outputs to supplement the integral I/Os of the CPUs
- For flexible adaptation of the controller to the task
- For subsequent upgrading of the system with additional inputs and outputs

*These modules are designed for*

- *an ambient range of -25 °C to + 70 °C, condensation permissible*
- *extraordinary medial load (for example by chloric and sulphuric atmospheres)*

### Technical specifications

|                            |                         |
|----------------------------|-------------------------|
| <b>6AG1 221-1BF22-2XB0</b> | see 6ES7 221-1BF22-0XA0 |
| <b>6AG1 221-1BH22-2XA0</b> | see 6ES7 221-1BH22-0XA0 |
| <b>6AG1 222-1BF22-2XB0</b> | see 6ES7 222-1BF22-0XA0 |
| <b>6AG1 222-1HF22-2XB0</b> | see 6ES7 222-1HF22-0XA0 |
| <b>6AG1 223-1BF22-2XB0</b> | see 6ES7 223-1BF22-0XA0 |
| <b>6AG1 223-1BH22-2XB0</b> | see 6ES7 223-1BH22-0XA0 |
| <b>6AG1 223-1BL22-2XB0</b> | see 6ES7 223-1BL22-0XA0 |
| <b>6AG1 223-1HF22-2XB0</b> | see 6ES7 223-1HF22-0XA0 |
| <b>6AG1 223-1PH22-2XB0</b> | see 6ES7 223-1PH22-0XA0 |
| <b>6AG1 223-1PL22-2XB0</b> | see 6ES7 223-1PL22-0XA0 |

### Ordering Data

### Order No.

|   |  |
|---|--|
| <b>SIPLUS EM 221 digital input module</b><br>(extended temperature range)<br>for CPU 222/224/224 XP/226<br><ul style="list-style-type: none"> <li>• 8 inputs, 24 V DC, electrically isolated, P-M switching <sup>A)</sup></li> <li>• 16 inputs, 24 V DC, electrically isolated, P-M switching <sup>A)</sup></li> </ul>  | <b>6AG1 221-1BF22-2XB0</b><br><br><b>6AG1 221-1BH22-2XA0</b>   |
| <b>SIPLUS EM 222 digital output module</b><br>(extended temperature range)<br>for CPU 222/224/224 XP/226<br><ul style="list-style-type: none"> <li>• 8 outputs, 24 V DC; 0.75 A, electrically isolated <sup>A)</sup></li> <li>• 8 outputs, 24 V DC / 24 to 230 V AC; 2 A, electrically isolated, relay outputs <sup>A)</sup></li> </ul>   | <b>6AG1 222-1BF22-2XB0</b><br><br><b>6AG1 222-1HF22-2XB0</b>   |
| <b>EM 223 digital input/output module</b><br>(extended temperature range)<br>for CPU 222/224/224 XP/226<br><ul style="list-style-type: none"> <li>• 4 inputs, 24 V DC, 4 outputs, 24 V DC; 0.75 A, electrically isolated <sup>A)</sup></li> <li>• 8 inputs, 24 V DC, 8 outputs, 24 V DC; 0.75 A, electrically isolated <sup>A)</sup></li> <li>• 16 inputs, 24 V DC, 16 outputs, 24 V DC; 0.75 A, electrically isolated <sup>A)</sup></li> <li>• 4 inputs, 24 V DC, 4 outputs, relays <sup>A)</sup></li> <li>• 8 inputs, 24 V DC, 8 outputs, relays <sup>A)</sup></li> <li>• 16 inputs, 24 V DC, 16 outputs, relays <sup>A)</sup></li> </ul> | <b>6AG1 223-1BF22-2XB0</b><br><br><b>6AG1 223-1BH22-2XB0</b><br><br><b>6AG1 223-1BL22-2XB0</b><br><br><b>6AG1 223-1HF22-2XB0</b><br><br><b>6AG1 223-1PH22-2XB0</b><br><br><b>6AG1 223-1PL22-2XB0</b> |
| <b>Accessories</b>  | see ordering data for S7-200 digital modules   |

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- Analog inputs and outputs for the SIMATIC S7-200
- With extremely short conversion times
- For connections of analog sensors and actuators without additional amplifier
- For solving the more complex automation tasks

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#### Technical specifications EM 231

|  | 6ES7 231-0HC22-0XA0 | 6ES7 231-0HC22-0XA0  |
|--|---------------------|--|
| <b>Current consumption</b>   |                     |  |
| •from load voltage L+ (no load), max.                                      | 60 mA               |  |
| •from backplane bus 5 V DC, max.   | 20 mA               |  |
| •Power dissipation, typical  | 2 W                 |  |
| <b>Connection system</b>   |                     |  |
| •Pluggable I/O terminals   | No                  |  |
| <b>Analog inputs</b>   |                     |  |
| •Number of analog inputs   | 4; Differential     |  |
| •Length of cable shielded, max   | 100 m; to sensor    |  |
| •Permissible input voltage for the voltage input (destruction limit), max. | 30 V                |  |
| •Permissible input voltage for the current input (destruction limit), max. | 32 mA               |  |
| Input ranges (rated values), voltages                                      |                     |  |
| - 0 to +5 V  | Yes                 |  |
| - 0 to +10 V   | Yes                 |  |
| - -2.5 V to +2.5 V   | Yes                 |  |
| - -5 V to +5 V   | Yes                 |  |
| Input ranges (rated values), currents                                      |                     |  |
| - 0 to 20 mA   | Yes                 |  |
| Characteristic curve linearization   |                     |  |
| - for voltage measurement  | no                  |  |
| - for current measurement  | no                  |  |
| Temperature compensation   |                     |  |
| - parameterizable  | No                  |  |
| <b>Analog value formation</b>  |                     |  |
| Integration and conversion time/triggering per channel                     |                     | 12 Bit   |
| - with over-range (bits incl. sign), max                                   |                     | 40 dB, DC up to 60 V for interference frequency 50 / 60 Hz |
| - Interference voltage suppression for interference frequency f1 in Hz     |                     | 250 µs   |
| - Conversion time (per channel)  |                     |  |
| Displayable conversion value range   |                     |  |
| - bipolar signals  |                     | -32,000 to +32,000   |
| - unipolar signals   |                     | 0 to 32000   |
| <b>Error/accuracies</b>  |                     |  |
| Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$          |                     | 12 V   |
| - Common-mode voltage, max.  |                     |  |
| <b>Potentials/ electrical isolation</b>                                    |                     |  |
| Analog output functions  |                     |  |
| - Electrical isolation, analog inputs                                      |                     | No   |
| <b>Dimensions and weight</b>   |                     |  |
| •Weight, approx.   |                     | 183 g  |
| •Width   |                     | 71.2 mm  |
| •Height  |                     | 80 mm  |
| •Depth   |                     | 62 mm  |

#### Technical specifications EM 232

| 6ES7 232-0HB22-0XA0                                       |                      |
|---|----------------------|
| <b>Current consumption</b>                                |                      |
| •from backplane bus 5 V DC, max.                          | 20 mA                |
| •from sensor current or ext. power supply (24 V DC), max. | 70 mA                |
| •Power dissipation, typical                               | 2 W                  |
| <b>Connection system</b>                                  |                      |
| •Pluggable I/O terminals                                  | No                   |
| <b>Analog outputs</b>                                     |                      |
| •Number of analog outputs                                 | 2                    |
| Output ranges, voltage                                    |                      |
| - -10 to +10 V  | Yes                  |
| Output ranges, current                                    |                      |
| - 4 to 20 mA  | Yes                  |
| Burden resistance (in the nominal output range)           |                      |
| - at voltage outputs, min.                                | 5 kΩ                 |
| - at current outputs, max.                                | 0.5 kΩ               |
| <b>Analog value formation</b>                             |                      |
| Integration and conversion time/triggering per channel    |                      |
| - with over-range   | U/12 bits, I/11 bits |
| Settling time   |                      |
| - for voltage output function                             | 100 μs               |
| - for current output function                             | 2 ms                 |
| Displayable conversion value range                        |                      |
| - bipolar signals   | -32,000 to +32,000   |
| - unipolar signals  | 0 to 32,000          |
| <b>Error/accuracies</b>                                   |                      |
| Operational limit in the entire temperature range         |                      |
| - Relative to the output range, voltage                   | +/- 2 %              |
| - Relative to the output range, current                   | +/- 2 %              |
| Basic error limit (operational limit at 25 °C)            |                      |
| - relative to the output range, voltage                   | +/- 0.5 %            |
| - relative to the output range, current                   | +/- 0.5 %            |
| <b>Potentials/ electrical isolation</b>                   |                      |
| Analog output functions                                   |                      |
| - Electrical isolation, analog output functions           | No                   |
| <b>Dimensions and weight</b>                              |                      |
| •Weight, approx.  | 148 g                |
| •Width  | 46 mm                |
| •Height   | 80 mm                |
| •Depth  | 62 mm                |

#### Technical specifications EM 235

| 6ES7 235-0KD22-0XA0  |                 |
|--|-----------------|
| <b>Current consumption</b>   |                 |
| •from backplane bus 5 V DC, max.   | 30 mA           |
| •from sensor current or ext. power supply (24 V DC), max.                  | 60 mA           |
| •Power dissipation, typical  | 2 W             |
| <b>Connection system</b>   |                 |
| •Pluggable I/O terminals   | No              |
| <b>Analog inputs</b>   |                 |
| •Number of analog inputs   | 4; Differential |
| •Permissible input voltage for the voltage input (destruction limit), max. | 30 V            |
| •Permissible input voltage for the current input (destruction limit), max. | 32 mA           |
| Input ranges (rated values), voltages                                      |                 |
| - Voltage  | Yes             |
| - 0 to +50 mV  | Yes             |
| - 0 to +100 mV   | Yes             |
| - 0 to +500 mV   | Yes             |
| - 0 to +1 V  | Yes             |
| - 0 to +5 V  | Yes             |
| - 0 to +10 V   | Yes             |
| - -1 V to +1 V   | Yes             |
| - -10 V to +10 V   | Yes             |
| - -100 mV to +100 mV   | Yes             |
| - -2.5 V to +2.5 V   | Yes             |
| - -25 mV to +25 mV   | Yes             |
| - -250 mV to +250 mV   | Yes             |
| - -5 V to +5 V   | Yes             |
| - -50 mV to +50 mV   | Yes             |
| - -500 mV to +500 mV   | Yes             |
| Input ranges (rated values), currents                                      |                 |
| - Current  | Yes             |
| - 0 to 20 mA   | Yes             |
| Characteristic curve linearization   |                 |
| - for voltage measurement  | No              |
| - for current measurement  | No              |
| Temperature compensation   |                 |
| - parameterizable  | No              |
| <b>Analog outputs</b>  |                 |
| •Number of analog outputs  | 1               |
| Output ranges, voltage   |                 |
| - -10 to +10 V   | Yes             |
| Output ranges, current   |                 |
| - 0 to 20 mA   | Yes             |
| Burden resistance (in the nominal output range)                            |                 |
| - at voltage outputs, min.   | 5 kΩ            |
| - at current outputs, max.   | 0.5 kΩ          |

# SIMATIC S7-200

## Analog modules

### Analog modules

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| Technical specifications (continued)  |                                  |
|---|----------------------------------|
|   | <b>6ES7 235-0KD22-0XA0</b>       |
| <b>Analog value formation</b><br>Integration and conversion time/triggering per channel |                                  |
| - with over-range (bits incl. sign), max  | 12 Bit; 11 bits for power output |
| - Basic conversion time, ms   | < 0.25 ms                        |
| - Interference voltage suppression for interference frequency f1 in Hz                  | 40 dB, DC to 60 Hz               |
| <b>Settling time</b>  |                                  |
| - for voltage output function   | 100 µs                           |
| - for current output function   | 2 ms                             |
| <b>Displayable conversion value range</b>   |                                  |
| - bipolar signals   | -32,000 to +32,000               |
| - unipolar signals  | 0 to 32,000                      |
| <b>Error/accuracies</b>   |                                  |
| Operational limit in the entire temperature range                                       |                                  |
| - Relative to the output range, voltage   | +/- 2 %                          |
| - Relative to the output range, current   | +/- 2 %                          |
| <b>Basic error limit (operational limit at 25 °C)</b>                                   |                                  |
| - relative to the output range, voltage   | +/- 0.5 %                        |
| - relative to the output range, current   | +/- 0.5 %                        |
| <b>Interference voltage suppression for f = n x (fl +/- 1 %)</b>                        |                                  |
| - Common-mode voltage, max.   | 12 V                             |
| <b>Potentials/ electrical isolation</b>   |                                  |
| <b>Analog output functions</b>  |                                  |
| - Electrical isolation, analog output functions   | No                               |
| <b>Analog input functions</b>   |                                  |
| - Electrical isolation, analog inputs   | No                               |
| <b>Dimensions and weight</b>  |                                  |
| •Weight, approx.  | 186 g                            |
| •Width  | 71.2 mm                          |
| •Height   | 80 mm                            |
| •Depth  | 62 mm                            |

| Ordering Data  | Order No.                  |
|--|----------------------------|
| <b>EM 231 analog input module</b> <sup>A)</sup><br>for CPU 222/224/224 XP/226;<br>4 inputs, 0 - 10 V,<br>12-bit resolution           | <b>6ES7 231-0HC22-0XA0</b> |
| <b>EM 232 analog output module</b> <sup>A)</sup><br>for CPU 222/224/224 XP/226;<br>2 outputs, ± 10 V,<br>12-bit resolution           | <b>6ES7 232-0HB22-0XA0</b> |
| <b>EM 235 analog input/output</b> <sup>A)</sup><br>for CPU 222/224/224 XP/226;<br>4 inputs, 1 output, ±10 V DC,<br>12-bit resolution | <b>6ES7 235-0KD22-0XA0</b> |
| <b>Grounding terminal</b>  | <b>6ES5 728-8MA11</b>      |
| 10 items   |                            |
| <b>Front flap set</b> <sup>A)</sup>  | <b>6ES7 291-3AX20-0XA0</b> |
| contains different covering flaps for CPU and EM;<br>Spare part  |                            |
| <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226<br>and STEP 7-Micro/Win V4                    |                            |
| German   | <b>6ES7 298-8FA24-8AH0</b> |
| English  | <b>6ES7 298-8FA24-8BH0</b> |
| French   | <b>6ES7 298-8FA24-8CH0</b> |
| Spanish  | <b>6ES7 298-8FA24-8DH0</b> |
| Italian  | <b>6ES7 298-8FA24-8EH0</b> |
| Chinese  | <b>6ES7 298-8FA24-8FH0</b> |

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- For user-friendly, high precision temperature detection
- 7 standard types of thermocouple can be used
- For measuring low-level analog signals ( $\pm 80$  mV), as well
- Easy to install in an existing system

#### Technical specifications

|   | 6ES7 231-7PD22-0XA0 |
|---|---------------------|
| <b>Current consumption</b>  |                     |
| • from load voltage L+ (no load), max.                                      | 60 mA               |
| • from backplane bus 5 V DC, max.   | 87 mA               |
| • Power dissipation, typical  | 1.8 W               |
| <b>Connection system</b>  |                     |
| • Pluggable I/O terminals   | No                  |
| <b>Analog inputs</b>  |                     |
| • Number of analog inputs   | 4                   |
| • Length of cable shielded, max   | 100 m; to sensor    |
| • Permissible input voltage for the voltage input (destruction limit), max. | 30 V                |
| • Loop resistance line  | 100 $\Omega$        |
| • Update time (all channels)  | 405 ms              |
| Input ranges (rated values), voltages                                       |                     |
| - -80 mV to +80 mV  | Yes                 |
| Input ranges (rated values), thermocouples                                  |                     |
| - Type E  | Yes                 |
| - Type J  | Yes                 |
| - Type K  | Yes                 |
| - Type N  | Yes                 |
| - Type R  | Yes                 |
| - Type S  | Yes                 |
| - Type T  | Yes                 |

|  | 6ES7 231-7PD22-0XA0                                     |
|--|---|
| <b>Analog value formation</b>  |   |
| • Measuring principle  | Sigma-Delta   |
| Integration and conversion time/triggering per channel                                 |   |
| - with over-range (bits incl. sign), max   | 16 Bit; Temperature 0.1 $^{\circ}$ C / 0.1 $^{\circ}$ F |
| - Interference voltage suppression for interference frequency f1 in Hz                 | 85 dB at 50 / 60 / 400 Hz                               |
| Displayable conversion value range   |   |
| - bipolar signals  | -27,648 to +27,648                                      |
| <b>Error/accuracies</b>  |   |
| • Cold connection point  | +/-1.5 $^{\circ}$ C                                     |
| • Repeatability in the settled state at 25 $^{\circ}$ C (relative to the output range) | +/- 0.05 %  |
| Operational limit in the entire temperature range                                      |   |
| - Relative to the output range, voltage  | +/- 0.1 %   |
| Interference voltage suppression for f = n x (f1 +/- 1 %)                              |   |
| - Common-mode voltage, max.  | 120 V; AC   |
| - Common-mode interference, min  | 120 dB; at 120 V AC                                     |
| <b>Potentials/ electrical isolation</b>  |   |
| Analog output functions  |   |
| - Electrical isolation, analog inputs  | Yes   |
| <b>Dimensions and weight</b>   |   |
| • Weight, approx.  | 210 g   |
| • Width  | 71.2 mm   |
| • Height   | 80 mm   |
| • Depth  | 62 mm   |

# SIMATIC S7-200

## Analog modules

### EM 231 thermocouple module

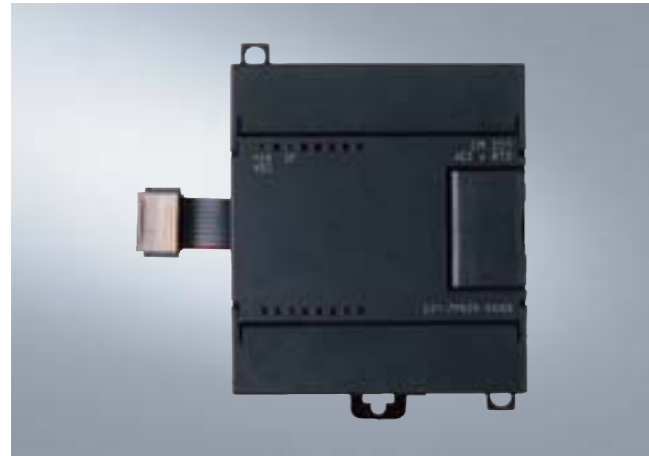
| Ordering Data  | Order No.                  |  | Order No.                  |
|--|----------------------------|--|----------------------------|
| <b>EM 231 thermocouple module</b> <sup>A)</sup><br>4 inputs +/- 80 mV, 15-bit resolution + sign, thermocouples type J, K, S, T, R, E, N              | <b>6ES7 231-7PD22-0XA0</b> | <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4 |                            |
| <b>Grounding terminal</b><br>10 items  | <b>6ES5 728-8MA11</b>      | German   | <b>6ES7 298-8FA24-8AH0</b> |
| <b>Backplane bus expansion cable</b> <sup>A)</sup><br>for connecting the two equipment tiers in a two-tier configuration, for CUP 222/224/224 XP/226 | <b>6ES7 290-6AA20-0XA0</b> | English  | <b>6ES7 298-8FA24-8BH0</b> |
|  |                            | French   | <b>6ES7 298-8FA24-8CH0</b> |
|  |                            | Spanish  | <b>6ES7 298-8FA24-8DH0</b> |
|  |                            | Italian  | <b>6ES7 298-8FA24-8EH0</b> |
|  |                            | Chinese  | <b>6ES7 298-8FA24-8FH0</b> |

A) Subject to export regulations: AL: N and ECCN: EAR99H

3

#### Overview

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- For user-friendly, high precision temperature detection
- Supports 31 standard resistance temperature sensors
- Easy to install in an existing system

#### Technical specifications

|  | 6ES7 231-7PB22-0XA0                     |  | 6ES7 231-7PB22-0XA0                 |
|--|---|--|-------------------------------------|
| <b>Current consumption</b>   |   | <b>Analog value formation</b>  |                                     |
| •from load voltage L+ (no load), max.                                      | 60 mA                                   | •Measuring principle   | Sigma-Delta                         |
| •from backplane bus 5 V DC, max.   | 87 mA                                   | Integration and conversion time/triggering per channel                     |                                     |
| •Power dissipation, typical  | 1.8 W; Sensor: 1 mW                     | - with over-range (bits incl. sign), max                                   | 16 Bit; Temperature 0.1 °C / 0.1 °F |
| <b>Connection system</b>   |   | - Interference voltage suppression for interference frequency f1 in Hz     | 85 dB at 50 / 60 / 400 Hz           |
| •Pluggable I/O terminals   | No                                      | Displayable conversion value range   |                                     |
| <b>Analog inputs</b>   |   | - bipolar signals  | -27,648 to +27,648                  |
| •Number of analog inputs   | 2                                       | <b>Error/accuracies</b>  |                                     |
| •Length of cable shielded, max   | 100 m; to sensor                        | •Repeatability in the settled state at 25°C (relative to the output range) | +/- 0.05 %                          |
| •Permissible input voltage for the voltage input (destruction limit), max. | 30 V; 30 V DC (sensor), 5 V DC (source) | Operational limit in the entire temperature range                          |                                     |
| •Loop resistance line  | 20 Ω; max. 2.7 ohms for Cu              | - Relative to the output range, voltage                                    | +/- 0.1 %                           |
| •Update time (all channels)  | 405 ms; 700 ms at Pt 10000              | Interference voltage suppression for f = n x (f1 +/- 1 %)                  |                                     |
| Input ranges (rated values), resistances                                   |   | - Common-mode voltage, max.  | 0 V                                 |
| - 0 to 150 ohms  | Yes                                     | - Common-mode interference, min  | 120 dB; at 120 V AC                 |
| - 0 to 300 ohms  | Yes                                     | <b>Potentials/ electrical isolation</b>                                    |                                     |
| - 0 to 600 ohms  | Yes                                     | Analog output functions  |                                     |
| Input ranges (rated values), resistance thermometer                        |   | - Electrical isolation, analog inputs                                      | Yes                                 |
| - Cu 10  | Yes                                     | <b>Dimensions and weight</b>   |                                     |
| - Ni 10  | Yes                                     | •Weight, approx.   | 210 g                               |
| - Ni 1000  | Yes                                     | •Width   | 71.2 mm                             |
| - Ni 120   | Yes                                     | •Height  | 80 mm                               |
| - Pt 100   | Yes                                     | •Depth   | 62 mm                               |
| - Pt 1000  | Yes                                     |  |                                     |
| - Pt 10000   | Yes                                     |  |                                     |
| - Pt 200   | Yes                                     |  |                                     |
| - Pt 500   | Yes                                     |  |                                     |



# SIMATIC S7-200

## Analog modules

### EM 231 RTD module

| Ordering Data  | Order No.                  | Ordering Data   | Order No.  |
|--|----------------------------|---|--|
| <b>EM 231 RTD module</b> <sup>A)</sup><br>2 inputs for thermistors<br>Pt100/200/500/1000/10000,<br>Ni100/120/1000, Cu10;<br>resistance 150/300/600 Ohms,<br>15-bit resolution + sign | <b>6ES7 231-7PB22-0XA0</b> | <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226<br>and STEP 7-Micro/Win V4<br><br>German<br>English<br>French<br>Spanish<br>Italian<br>Chinese | <b>6ES7 298-8FA24-8AH0</b><br><b>6ES7 298-8FA24-8BH0</b><br><b>6ES7 298-8FA24-8CH0</b><br><b>6ES7 298-8FA24-8DH0</b><br><b>6ES7 298-8FA24-8EH0</b><br><b>6ES7 298-8FA24-8FH0</b> |
| <b>Grounding terminal</b><br>10 items  | <b>6ES5 728-8MA11</b>      |   |  |
| <b>Backplane bus expansion cable</b> <sup>A)</sup><br>for connecting the two equipment tiers in a two-tier configuration, for CUP 222/224/224 XP/226                                 | <b>6ES7 290-6AA20-0XA0</b> |   |  |

3

A) Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



- Analog inputs and outputs for the SIMATIC S7-200
- With extremely short conversion times
- For connections of analog sensors and actuators without additional amplifier
- For solving the more complex automation tasks

*These modules are designed for*

- *an ambient range of -25 °C to + 70 °C, condensation permissible*
- *extraordinary medial load (for example by chloric and sulphuric atmospheres)*

### Technical specifications

|                            |                         |
|----------------------------|-------------------------|
| <b>6AG1 231-0HC22-2XB0</b> | see 6ES7 231-0HC22-0XA0 |
| <b>6AG1 232-0HB22-2XB0</b> | see 6ES7 232-0HB22-0XA0 |
| <b>6AG1 235-0KD22-2XB0</b> | see 6ES7 235-0KD22-0XA0 |

### Ordering Data

### Order No.

|  |   |
|--|---|
| <b>SIPLUS EM 231 analog input module</b> <sup>A)</sup><br>(extended temperature range)<br>for CPU 222/224/224 XP/226;<br>4 inputs, 0-10 V, resolution 12 bit                       | <b>6AG1 231-0HC22-2XB0</b>                    |
| <b>SIPLUS EM 232 analog output module</b> <sup>A)</sup><br>(extended temperature range)<br>for CPU 222/224/224 XP/226;<br>2 outputs, ± 10 V, resolution 12 bit                     | <b>6AG1 232-0HB22-2XB0</b>                    |
| <b>SIPLUS EM 235 analog input/output module</b> <sup>A)</sup><br>(extended temperature range)<br>for CPU 222/224/224 XP/226;<br>4 inputs, 1 output, ±10 V DC,<br>resolution 12 bit | <b>6AG1 235-0KD22-2XB0</b>                    |
| <b>Accessories</b>   | siehe Ordering Data for S7-200 analog modules |

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- Function modules for simple positioning tasks (1 axis)
- Stepper motors and servo motors from the Micro Stepper to the high-performance servo drive can be connected
- Flexible connection possibilities
- Full support from STEP 7-Micro/WIN with parameterization and startup

3

#### Technical specifications

| 6ES7 253-1AA22-0XA0                                       |   |
|---|---|
| <b>Supply voltages</b>                                    |   |
| Rated value   | 11 V  |
| - permissible range, lower limit (DC)                     | 30 V  |
| - permissible range, upper limit (DC)                     |   |
| <b>Current consumption</b>                                |   |
| •from backplane bus 5 V DC, max.                          | 190 mA  |
| •from supply voltage L+, max.                             | 300 mA; from 12 V DC, 130 mA from 24 V DC   |
| <b>Configuration</b>                                      |   |
| •Number of modules per CPU                                | max. 5 with CPU 226/226XM, max. 3 with CPU 224, max. 1 with CPU 222   |
| <b>Digital inputs</b>                                     |   |
| •Number of digital inputs                                 | 5   |
| •Functions  | Stop (STP), reference point switch (RPS), upper limit switch (LMT+), lower limit switch (LMT-), zero point (ZP) |
| Length of cable   |   |
| - Length of cable shielded, max                           | 100 m; STP, RPS, LMT+, LMT- 100 m, ZP 10 m  |
| - Length of cable unshielded, max                         | 30 m; STP, RPS, LMT+, LMT- 30 m, ZP not advisable   |
| •Type   | IEC Type 1, p-reading   |
| Input voltage   |   |
| - Rated value, DC   | 24 V  |
| - for signal "0"  | STP, RPS, LMT+, LMT- DC 5 V; ZP DC 1 V  |
| - for signal "1"  | STP, RPS, LMT+, LMT- DC 15 V; ZP DC 3 V   |
| Input delay (at rated value of the input voltage)         |   |
| •For standard inputs                                      |   |
| - Parameterizable   | Yes; STP, RPS, LMT+, LMT- 0.2 to 12.8 ms<br>ZP min 2 μs   |
| <b>Sensor</b>   |   |
| Connectable encoders                                      |   |
| - 2-wire BEROs  | Yes   |
| - permissible closed-circuit current (2-wire BEROs), max. | 1 mA  |
| <b>Drive interface</b>                                    |   |
| Signal output I   |   |
| - Number  | 4; choice of RS422/RS485 or 5 V DC  |
| - Type  | RS422/RS485 electrically isolated (P0+, P0-, P1+, P1-)  |
| - Differential output voltage, min.                       | 2.8 V; RL=200 ohms  |
| - Pulse frequency   | 200 kHz; P0+, P0-, P1+, P1-, P0, P1   |
| - Length of cable, max.                                   | 10 m; 10 m shielded; 1 m unshielded   |
| Signal output III   |   |
| - Type  | 5 V DC isolated (P0, P1, DIS, CLR)  |
| - Output voltage  | 30 V DC   |
| - Output current  | 50 mA; output delay (DIS, CLR) max. 30 μs   |
| <b>Potentials/ electrical isolation</b>                   |   |
| Digital input functions                                   |   |
| - between the channels                                    | Yes   |
| - between the channels, in groups of                      | 1 (STP, RPS, ZP), 2 (LMT-, LMT+)  |
| <b>Dimensions and weight</b>                              |   |
| •Weight, approx.  | 190 g   |
| •Width  | 71.2 mm   |
| •Height   | 80 mm   |
| •Depth  | 62 mm   |

# SIMATIC S7-200

## Function modules

### EM 253 positioning module

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| Ordering Data  | Order No.                  |  | Order No.                  |
|--|----------------------------|--|----------------------------|
| <b>EM 253 positioning module</b> <sup>A)</sup><br>for activating stepper motors or servo drives  | <b>6ES7 253-1AA22-0XA0</b> | <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4 |                            |
| <b>Grounding terminal</b><br>10 items  | <b>6ES5 728-8MA11</b>      | German   | <b>6ES7 298-8FA24-8AH0</b> |
| <b>Backplane bus expansion cable</b> <sup>A)</sup><br>for connecting the two equipment tiers in a two-tier configuration, for CUP 222/224/224 XP/226 | <b>6ES7 290-6AA20-0XA0</b> | English  | <b>6ES7 298-8FA24-8BH0</b> |
|  |                            | French   | <b>6ES7 298-8FA24-8CH0</b> |
|  |                            | Spanish  | <b>6ES7 298-8FA24-8DH0</b> |
|  |                            | Italian  | <b>6ES7 298-8FA24-8EH0</b> |
|  |                            | Chinese  | <b>6ES7 298-8FA24-8FH0</b> |

A) Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



- Modem expansion module for SIMATIC S7-200
- The Plug&Play solution for all classical modem tasks in the PLC field
- Used for remote maintenance/ remote diagnostics, CPU-to-CPU/PC communication or SMS/pager messaging
- Minimal engineering outlay required
- Replaces external modems connected via the communications interface of the CPU
- Easy to retrofit

3

### Technical specifications

|                                       | 6ES7 241-1AA22-0XA0   |
|---------------------------------------|---|
| <b>Voltages and currents</b>          |   |
| Load voltage L+                       |   |
| - Rated value (DC)                    | 24 V  |
| - permissible range, lower limit (DC) | 20.4 V  |
| - permissible range, upper limit (DC) | 28.8 V  |
| <b>Current consumption</b>            |   |
| •from load voltage L+ (no load), max. | 70 mA   |
| •from backplane bus 5 V DC, max.      | 80 mA; from expansion bus   |
| •Power dissipation, typical           | 2.1 W   |
| <b>Communication functions</b>        |   |
| •Bus protocol/transfer protocol       | PPI, Modbus   |
| <b>Connection system</b>              |   |
| •Phone lines                          | RJ11 (4 cables, 6 contacts)   |
| <b>Modem</b>                          |   |
| •Standards                            | Bell 103, Bell 212, V. 21, V. 22, V. 22 bis, V. 23c, V. 32, V. 32 bis, V. 34 (preset) |
| •Tone dialing                         | Yes   |
| •Pulse dialing                        | Yes   |
| <b>Dimensions and weight</b>          |   |
| •Weight, approx.                      | 190 g   |
| •Width                                | 71.2 mm   |
| •Height                               | 80 mm   |
| •Depth                                | 62 mm   |

### Ordering Data

| Ordering Data  | Order No.                  |
|--|----------------------------|
| <b>EM 241 modem<sup>A)</sup></b><br>Analog modem for remote maintenance/remote diagnostics; CPU-to-CPU/PC communication, SMS/pager messaging | <b>6ES7 241-1AA22-0XA0</b> |
| <b>Grounding terminal</b><br>10 items  | <b>6ES5 728-8MA11</b>      |
| <b>S7-200 programmable controller, system manual</b><br>for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4                               |                            |
| German   | <b>6ES7 298-8FA24-8AH0</b> |
| English  | <b>6ES7 298-8FA24-8BH0</b> |
| French   | <b>6ES7 298-8FA24-8CH0</b> |
| Spanish  | <b>6ES7 298-8FA24-8DH0</b> |
| Italian  | <b>6ES7 298-8FA24-8EH0</b> |
| Chinese  | <b>6ES7 298-8FA24-8FH0</b> |

A) Subject to export regulations: AL: N and ECCN: EAR99H

#### Overview



- For connection of the S7-22x to PROFIBUS DP (as slave) and MPI
- Can be simultaneously operated as MPI slave and DP slave
- Transmission rate max. 12 Mbps
- Can be used with CPU from version 6ES7 22x-xxx 21-xxxx

#### Technical specifications

|  | 6ES7 277-0AA22-0XA0   |  | 6ES7 277-0AA22-0XA0  |
|--|---|--|--|
| <b>Voltages and currents</b>                               |   | <b>Connection system</b>                 |  |
| Load voltage L+  |   | • Pluggable I/O terminals                | No   |
| - Rated value (DC)   | 24 V  | <b>PROFIBUS DP</b>                       |  |
| - permissible range, lower limit (DC)                      | 20.4 V  | • Transmission rate, max.                | 12 Mbit/s;<br>9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 kbit/s<br>1 / 1.5 / 3 / 6 / 12 Mbit/s |
| - permissible range, upper limit (DC)                      | 28.8 V  | • Station addresses                      | 0 to 99, adjustable  |
| <b>Current consumption</b>                                 |   | • Length of cable, max.                  | 1,200 m;<br>100 to 1200 m, depending on the transmission rate                                |
| • from backplane bus 5 V DC, max.                          | 150 mA  | • Number of stations in the system, max. | 126; of which max. 99 EM 277   |
| • from sensor current or ext. power supply (24 V DC), max. | 180 mA; 30 to 180 mA  | • Number of stations per segment, max.   | 32   |
| • Power dissipation, typical                               | 2.5 W   | • Automatic transmission speed detection | Yes  |
| <b>Configuration</b>                                       |   | <b>Dimensions and weight</b>             |  |
| • Connectable stations                                     | TD 200 from V2.0, OP, TP, PG/PC, S7-300/400, PROFIBUS DP-Master | • Weight, approx.                        | 175 g  |
| <b>Communication functions</b>                             |   | • Width                                  | 71.2 mm  |
| • Bus protocol/transfer protocol                           | PROFIBUS DP (Slave), MPI (Slave)                                | • Height                                 | 80 mm  |
| Number of connections                                      |   | • Depth                                  | 62 mm  |
| - MPI connections, max.                                    | 6   |  |  |
| - MPI connections reserved for OP communication            | 1   |  |  |
| - MPI connections reserved for PG communication            | 1   |  |  |
| <b>Interfaces</b>  |   |  |  |
| • Number of RS485 interfaces                               | 1   |  |  |
| 5 V DC   |   |  |  |
| - Output current, max.                                     | 90 mA   |  |  |
| 24 V DC  |   |  |  |
| - Voltage range  | 20.4 to 28.8 V  |  |  |
| - Output current, max.                                     | 120 mA  |  |  |
| - Current limiting   | 0.7 to 2.4 A  |  |  |

#### Ordering Data

| Ordering Data   | Order No.                  | Ordering Data  | Order No.                  |
|---|----------------------------|--|----------------------------|
| <b>PROFIBUS DP EM 277 input module</b> <sup>A)</sup>                      | <b>6ES7 277-0AA22-0XA0</b> | <b>SIPLUS PROFIBUS DP EM 277 input module (extended temperature range)</b> | <b>6AG1 277-0AA22-2XA0</b> |
| for CPU 222/224/224 XP/226, for connecting to PROFIBUS DP (slave) and MPI |                            | for CPU 222/224/224 XP/226, for connecting to PROFIBUS DP (slave) and MPI  |                            |

A) Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



The CP 243-2 is the AS-Interface master for the innovated generation of SIMATIC S7-200. The communications processor (6GK1 243-2AX01-0AX0) supports the extended AS-Interface specification V2.1 and has the following functions:

- Up to 62 AS-Interface slaves can be connected and integrated analog value transfer (according to the extended AS-Interface specification V2.1)
- Supports all AS-Interface master functions in accordance with the extended AS-Interface specification V2.1
- Status displays for operating states and display of the functional readiness of connected slaves with LEDs in the front panel
- Indication of errors (incl. AS-Interface voltage errors, configuration errors) with LEDs in the front panel
- Compact enclosure designed to match the new generation of SIMATIC S7-200.

### Technical specifications

|                                |  |
|--------------------------------|--|
| AS-Interface specification     | V 2.1  |
| Interfaces                     |  |
| •Address space used in the PLC | Corresponding to 2 I/O modules (8 DI/8 DO and 8 AI/8 AO) |
| •AS-Interface connection       | Terminal   |
| Current consumption            |  |
| •Via AS-Interface              | Max. 100 mA  |
| •Through backplane bus         | Typ. 220 mA at DC 5 V                                    |
| Power loss                     | Approx. 2 W  |
| Perm. environmental conditions |  |
| •Operating temperature         |  |
| - Horizontal mounting          | 0 °C to +55 °C   |
| - Vertical mounting            | 0 °C to +45 °C   |
| •Transport/storage temperature | - 40 °C to +70 °C  |
| •Relative humidity             | Max. 95% at +25 °C                                       |
| Design                         |  |
| •Module format                 | S7-22x expansion module                                  |
| •Dimensions (W x H x D) in mm  | 71.2 x 80 x 62 (H+16 mm with holes for wall mounting)    |
| •Weight                        | Approx. 250 g  |
| •Space required                | 1 slot   |

3

### Ordering Data

#### Order No.

**CP 243-2 communications processor** <sup>A)</sup> **6GK7 243-2AX01-0XA0**

For connection of SIMATIC S7-200 (2<sup>nd</sup> generation) to AS-Interface with bus connector

#### Manual for CP 243-2

Including AS-Interface fundamentals and diskette with program examples paper version

- German **6GK7 243-2AX00-8AA0**
- English **6GK7 243-2AX00-8BA0**
- French **6GK7 243-2AX00-8CA0**
- Spanish **6GK7 243-2AX00-8DA0**
- Italian **6GK7 243-2AX00-8EA0**

A) Subject to export regulations: AL: N and ECCN: EAR99H



### Overview



- Connection of SIMATIC S7-200 to Industrial Ethernet with
  - 10/100 Mbit/s
  - Half/full duplex
  - RJ 45 socket
  - TCP/IP
- Configuration, remote programming and service is possible with STEP 7-Micro/WIN through Industrial Ethernet (program upload and download, status)
- CPU/CPU communication is possible through Industrial Ethernet (Client + Server, 8 S7 connections + 1 PG connection)
- Thanks to integration in S7-0 PC, further processing of PLC data in PC applications is possible
- Modules can be replaced without the need for a programming device

### Technical specifications

|                                       |   |
|---------------------------------------|---|
| Data transmission rate                | 10/100 Mbit/s autosensing   |
| Interfaces                            | <ul style="list-style-type: none"> <li>• 10 BaseT, 100 Base TX RJ45</li> <li>• Connection for power supply 24 V DC (± 5%)</li> </ul>  |
| Current consumption                   | <ul style="list-style-type: none"> <li>• From backplane bus 55 mA</li> <li>• From external 24 V DC 60 mA</li> </ul>   |
| Power loss at 24 V DC                 | 1.75 W  |
| Perm. environmental conditions        | <ul style="list-style-type: none"> <li>• Operating temperature                             <ul style="list-style-type: none"> <li>- Horizontal mounting 0°C to +55°C</li> <li>- Vertical mounting 0°C to +45°C</li> </ul> </li> <li>• Transport/storage temperature -40 °C to +70 °C</li> <li>• Relative humidity Max. 95% at +25 °C</li> </ul> |
| Design                                | <ul style="list-style-type: none"> <li>• Dimensions (W x H x D) in mm 71.2 x 80 x 62</li> <li>• Weight 150 g</li> </ul>   |
| <b>Performance data</b>               |   |
| S7 communication/<br>PG communication | <ul style="list-style-type: none"> <li>• Number of usable connections 8 S7 connections + 1 PG connection</li> </ul>   |
| Configuration                         | With STEP 7-Micro/WIN (V3.2 SP1 and higher)   |

### Ordering Data

### Order No.

|   |                            |
|---|----------------------------|
| <b>CP 243-1 communications processor <sup>D)</sup></b><br>for connection of SIMATIC S7-200 to Industrial Ethernet; for S7 communication, PG communication with electronic manual on CD-ROM, German, English, French, Italian, Spanish   | <b>6GK7 243-1EX00-0XE0</b> |
| <b>Programming software STEP 7-Micro/WIN32 V3.2 for SP3 and higher</b><br><i>Target system:</i><br>All CPUs of the SIMATIC S7-200<br><i>Prerequisite:</i><br>Windows 95/98/NT/2000/XP on PG or PC with 80486 or Pentium processor<br><i>delivery package:</i><br>German, English, French, Spanish, Italian; with online documentation |                            |
| Single license <sup>B)</sup>  | <b>6ES7 810-2CC03-0YX0</b> |
| Single license Upgrade <sup>1) B)</sup>   | <b>6ES7 810-2CC03-0YX3</b> |

1) Upgrade for all previous STEP 7-Micro/WIN and STEP 7-Micro/DOS versions

B) Subject to export regulations: AL: N and ECCN: EAR99S

D) Subject to export regulations: AL: N and ECCN: 5D992B1

# SIMATIC S7-200 Communication

CP 243-1 IT

## Overview



- Connection of SIMATIC S7-200 to Industrial Ethernet with
  - 10/100 Mbit/s
  - Half/full duplex
  - RJ45 socket
  - TCP/IP
- Configuration, remote programming and service is possible with STEP 7-Micro/WIN through Industrial Ethernet (program upload and download, status)
- CPU/CPU communication is possible through Industrial Ethernet (Client + Server, 8 S7 connections + 1 PG connection)
- IT communication
  - Web function
  - E-mail function
  - FTP Client function for program-controlled data exchange (e.g. DOS, UNIX, LINUX, embedded systems)
- FTP server with 8 Mbyte memory
- OPC enables further processing of PLC data in PC applications

## Technical specifications

|   |  |
|---|--|
| Data transmission rate                            | 10/100 Mbit/s autosensing                  |
| Interfaces  |  |
| • 10BaseT, 100BaseTX                              | RJ45                                       |
| • Connection for power supply                     | 24 V DC (± 5%)                             |
| Current consumption                               |  |
| • From backplane bus                              | 55 mA                                      |
| • From external 24 V DC                           | 60 mA                                      |
| Power loss at 24 V DC                             | 1.75 W                                     |
| Perm. environmental conditions                    |  |
| • Operating temperature                           |  |
| - Horizontal mounting                             | 0°C to +55°C                               |
| - Vertical mounting                               | 0°C to +45°C                               |
| • Transport/storage temperature                   | -40 °C to +70 °C                           |
| • Relative humidity                               | Max. 95% at +25 °C                         |
| Design  |  |
| • Dimensions (W x H x D) in mm                    | 71.2 x 80 x 62                             |
| • Weight  | 150 g                                      |
| <b>Performance data</b>                           |  |
| IT communication                                  |  |
| • Number of connections to an e-mail server       | 1  |
| • E-mail client                                   | 32 E-mails with max. 1024 characters       |
| • Number of FTP connections                       | 1  |
| • Number of HTTP connections                      | 4  |
| • Adjustable access enable program                | 8 users                                    |
| • Memory capacity of the Flash Memory file system | 8 MB                                       |
| • Service life of the Flash Memory cells          | 1,000,000 write cycles                     |
| S7 communication/<br>PG communication             |  |
| • Number of usable connections                    | 8 S7 connections + 1 PG connection         |
| Configuration                                     | With STEP 7-Micro/WIN, V3.2 SP3 and higher |

3

## Ordering Data

## Order No.

|  |                            |
|--|----------------------------|
| <b>CP 243-1 IT communications processor</b> <sup>D)</sup>  | <b>6GK7 243-1GX00-0XE0</b> |
| for connection of SIMATIC S7-200 to Industrial Ethernet; for S7 communication, PG communication E-mail and WWW server; with electronic manual on CD-ROM<br>German, English, French, Italian, Spanish |                            |
| <b>Programming software STEP 7-Micro/WIN32 V3.2 for SP3 and higher</b>   |                            |
| <i>Target system:</i><br>All CPUs of the SIMATIC S7-200  |                            |
| <i>Prerequisite:</i><br>Windows 95/98/NT/2000/XP on PG or PC with 80486 or Pentium processor   |                            |
| <i>Delivery package:</i><br>German, English, French, Spanish, Italian; with online documentation   |                            |
| Single license <sup>B)</sup>   | <b>6ES7 810-2CC03-0YX0</b> |
| Single license Upgrade <sup>1) B)</sup>  | <b>6ES7 810-2CC03-0YX3</b> |

1) Upgrade for all previous STEP 7-Micro/WIN and STEP 7-Micro/DOS versions

B) Subject to export regulations: AL: N and ECCN: EAR99S

D) Subject to export regulations: AL: N and ECCN: 5D992B1

#### Overview



The regulated load power supply for the SIMATIC S7-200.

- Coordinated design and functionality, can be integrated easily into the PLC network.
- For reliably powering the controller, encoders and sensors with 24 V DC, 3.5 A.
- Flexible implementation, either in industry or in the domestic supply system

#### Technical specifications

|   |  |
|---|--|
| <b>Type</b>   | <b>3.5 A</b>   |
| <b>Order No.</b>  | <b>6EP1 332-1SH31</b>  |
| <b>Input</b>  | Single-phase AC  |
| Rated voltage $V_{in rated}$                              | <b>120/230 V AC</b><br>Settable using wire jumper                                  |
| Voltage range   | 93 to 132 V/187 to 264 V AC  |
| Overvoltage strength                                      | $2.3 \times V_{in rated}$ , 1.3 ms   |
| Mains buffering $I_{out rated}$                           | > 20 ms at $V_{in} = 187$ V  |
| Rated line frequency; range                               | 50/60 Hz, 47 to 63 Hz  |
| Rated current $I_{in rated}$                              | 1.65/0.95 A  |
| Inrush current limitation (+25 °C)                        | < 33 A, < 3 ms ( $V_{in} = 230$ V)   |
| $I^2t$  | < 1.0 A <sup>2</sup> s   |
| Integrated line-side fuse                                 | T 2.5 A/250 V (not accessible)   |
| Recommended circuit-breaker (EC 898) in mains supply line | Two-pole circuit-breaker from 10 A, Characteristic C or from 6 A, Characteristic D |
| <b>Output</b>   | Stabilized, floating direct voltage  |
| Rated voltage $V_{out rated}$                             | <b>24 V DC</b>   |
| Total tolerance   | ± 5 % (typ. ± 2 %)   |
| •Stat. mains compensation                                 | Approx. ± 0.1 %  |
| •Stat. load compensation                                  | Approx. ± 0.2 %  |
| Residual ripple (clock frequency: approx. 50 kHz)         | < 150 mV <sub>pp</sub> (typ. 30 mV <sub>pp</sub> )                                 |
| Spikes (bandwidth: 20 MHz)                                | < 240 mV <sub>pp</sub> (typ. 110 mV <sub>pp</sub> )                                |
| Setting range   | -  |
| Status display  | -  |
| Power ON/OFF behavior                                     | No overshoot of $V_{out}$ (soft start)   |
| Starting delay/voltage rise                               | < 1 s/typ. 80 ms   |
| Rated current $I_{out rated}$                             | <b>3.5 A</b>   |
| Current range   |  |
| •Up to +45 °C   | 0 to 3.5 A   |
| •Up to +60 °C   | 0 to 3.5 A   |
| Dyn. V/I with   |  |
| •Starting on short circuit                                | typ. 5 A for 100 ms  |
| •Short-circuit in operation                               | typ. 5 A for 100 ms  |
| Parallel connection for increased output                  | Yes, up to 5   |

|  |   |
|--|---|
| <b>Type</b>  | <b>3.5 A</b>  |
| <b>Order No.</b>                                   | <b>6EP1 332-1SH31</b>   |
| <b>Efficiency</b>                                  |   |
| Efficiency at $V_{out rated}$ , $I_{out rated}$    | Approx. 84 %  |
| Power loss at $V_{out rated}$ , $I_{out rated}$    | Approx. 16 W  |
| <b>Control</b>                                     |   |
| Dyn. mains compensation ( $V_{in rated} \pm 15$ %) | ± 0.3 % $V_{out}$   |
| Dyn. load compensation ( $I_{out}$ : 50/100/50 %)  | < ± 10 % $V_{out}$ (typ. ± 3 % $V_{out}$ )  |
| Settling time                                      |   |
| •Load step from 50 to 100%                         | < 5 ms  |
| •Load step from 100 to 50%                         | < 5 ms  |
| <b>Protection and monitoring</b>                   |   |
| Output overvoltage protection                      |   |
| Current limitation                                 | 3.8 A   |
| Short-circuit protection                           | Stabilized current characteristic to typ. 14 V, electronic shutdown below that, automatic restart |
| RMS sustained short-circuit current                | < 4 A   |
| Overload/short-circuit indicator                   | -   |
| <b>Safety</b>                                      |   |
| Galvanic isolation primary/secondary               | Yes, SELV output voltage $V_{out}$ acc. to EN 60950   |
| Protective class                                   | Class I   |
| Discharge current                                  | < 3.5 mA  |
| TÜV test   | Yes   |
| CE-marking   | Yes   |
| UL/cUL (CSA), approval                             | Yes, cULus listed (UL 508, CSA 22.2 No. 14-M91), File E143289                                     |
| FM approval  | -   |
| Appr. for use in marine vessels                    | -   |
| Degree of protection (EN 60529)                    | IP20  |

# SIMATIC S7-200

## Power supplies

### Power supplies

#### Technical specifications (Continued)

|  |   |
|--|---|
| <b>Type</b>                                  | <b>3.5 A</b>  |
| <b>Order No.</b>                             | <b>6EP1 332-1SH31</b>   |
| <b>EMC</b>                                   |   |
| Interference emission                        | EN 55022 Class B  |
| Line harmonics limitation                    | EN 61000-3-2  |
| Interference immunity                        | EN 61000-6-2  |
| <b>Operating specifications</b>              |   |
| Ambient temperature range                    | 0 to +60°C with natural convection  |
| Transportation and storage temperature range | -25 to +85 °C   |
| Humidity rating                              | Climatic class 3K3 acc. to EN 60721, no condensation  |
| <b>Mechanical specifications</b>             |   |
| Connections                                  |   |
| •Mains input L, N, PE                        | One screw-type terminal each for 0.5 to 1 mm <sup>2</sup> finely stranded, 0.5 to 1.5 mm <sup>2</sup> single-core |
| •Output L+                                   | 1 screw-type terminal for 0.5 to 1 mm <sup>2</sup>  |
| •Output M                                    | 2 screw-type terminals for 0.5 to 1 mm <sup>2</sup>   |
| Dimensions (W x H x D) in mm                 | 160 x 80 x 62   |
| Weight approx.                               | 0.5 kg  |
| Mounting                                     | Snap-mounting on DIN rail EN 50022-35x15/7.5, wall mounting   |
| <b>Accessories</b>                           | Mounting bracket  |

#### Ordering Data

#### Order No.

|   |                       |
|---|-----------------------|
| <b>Stabilized load power supply SITOP power 3.5 A<sup>A)</sup></b><br>120/230 V AC, 24 V/3.5 A DC   | <b>6EP1 332-1SH31</b> |
| <b>Mounting bracket</b><br>for space-saving installation of power supply on the cabinet rear panel (the power supply is mounted with the side wall on the rear panel of the housing);<br>for switchgear cabinets with a depth of 240 mm or more | <b>6EP1 971-1AA01</b> |

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A) Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



- The user-friendly text display for the S7-200
- For control and monitoring: Message text display, intervention in PLC program, setting of inputs and outputs
- Direct connection to CPU interface using supplied cable or incorporation into network (also via EM 277)
- No separate power supply required
- No separate parameterization software required
- Addressing and setting of contrast in supplied menu

| Ordering Data   | Order No.  |
|---|--|
| <b>Text Display TD 200</b><br>for connecting to SIMATIC S7-200; used with STEP 7 Micro/WIN V3.2 SP4 and higher.   | <b>6ES7 272-0AA30-0YA0</b>                               |
| <b>PROFIBUS bus connector IP20 with 90° cable feeder</b><br>•without PG connection<br>•with PG connection   | <b>6ES7 972-0BA12-0XA0</b><br><b>6ES7 972-0BB12-0XA0</b> |
| <b>PROFIBUS bus connector IP20 with 35° cable feeder</b><br>•without PG connection<br>•with PG connection   | <b>6ES7 972-0BA41-0XA0</b><br><b>6ES7 972-0BB41-0XA0</b> |
| <b>PROFIBUS FC Standard Cable</b><br>for connecting to PPI; standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, up to 1000 m, minimum order 20 m | <b>6XV1 830-0EH10</b>                                    |

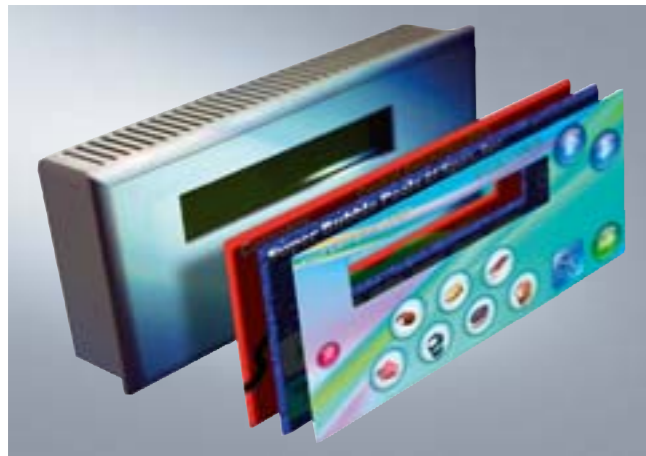
### Technical specifications

| 6ES7 272-0AA30-0YA0  |   |
|--|---|
| <b>Power supply</b><br>Input voltage<br>- Rated value (DC)   | 24 V; Power supplied through the S7-200 communications interface or optional external power supply unit. The CPU sensor power supply (24 V DC) is not brought into load |
| Input current<br>- Rated value at 24 V DC  | 120 mA  |
| <b>MPI</b><br>•Transmission rate (PPI), max.   | 187.5 kBit/s  |
| <b>1st interface</b><br>•Physical  | RS 485  |
| Functionality<br>- PPI   | Yes   |
| PPI<br>- Number of stations  | 126; S7-200, OP, TP, TBP, PG/PC   |
| <b>Operator control and monitoring</b><br>Display<br>- Type<br>- Number of lines<br>- Number of characters per line<br><br>- Height of characters                                  | LCD backlit<br>2<br>20; Chars/line:<br>ASCII, Cyrillic;<br>10 chars per line:<br>Chinese<br>5 mm  |
| <b>Environmental requirements</b><br>Operating temperature<br>- min.<br>- max.   | 0 °C<br>60 °C   |
| Storage/transportation temperature<br>- min.<br>- max.   | -40 °C<br>70 °C   |
| Degree of protection and class of protection<br>- IP 65  | Yes; frontal  |
| <b>Dimensions and weight</b><br>•Weight, approx.<br>•Width<br>•Height<br>•Depth<br>•Installation cutout, width<br>•Installation cutout, height<br>•Cabinet/control panel thickness | 250 g<br>148 mm<br>76 mm<br>27 mm<br>138 mm<br>68 mm<br>0.3 mm; 0.3 to 4 mm   |

# SIMATIC S7-200 Human Machine Interface

## TD 200C text display

### Overview



- The user-friendly text display for the S7-200 with customizable display
- For control and monitoring:  
Message text display, intervention in PLC program, setting of inputs and outputs
- Direct connection to CPU interface using supplied cable or incorporation into network (also via EM 277)
- No separate power supply required
- No separate parameterization software required
- Frontpanel design can be individually selected
- Addressing and setting of contrast in supplied menu

| Ordering Data   | Order No.  |
|---|--|
| <b>Text Display TD 200C<sup>A)</sup></b><br>With individually configurable control elements on the front of the device; for connecting to SIMATIC S7-200; can be used with STEP 7-Micro/WIN V4 and higher | <b>6ES7 272-1AA10-0YA0</b>                               |
| <b>PROFIBUS bus connector IP20 with 90° cable feeder</b><br>•without PG connection<br>•with PG connection   | <b>6ES7 972-0BA12-0XA0</b><br><b>6ES7 972-0BB12-0XA0</b> |
| <b>PROFIBUS bus connector IP20 with 35° cable feeder</b><br>•without PG connection<br>•with PG connection   | <b>6ES7 972-0BA41-0XA0</b><br><b>6ES7 972-0BB41-0XA0</b> |
| <b>PROFIBUS FC Standard Cable</b><br>for connecting to PPI; standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, up to 1000 m, minimum order 20 m                   | <b>6XV1 830-0EH10</b>                                    |

A) Subject to export regulations: AL: N and ECCN: EAR99H

### Technical specifications

| 6ES7 272-1AA10-0YA0                          |   |
|--|---|
| <b>Power supply</b>                          |   |
| Input voltage<br>- Rated value (DC)          | 24 V; Power supplied through the S7-200 communications interface or optional external power supply unit. The CPU sensor power supply (24 V DC) is not brought into load |
| Input current<br>- Rated value at 24 V DC    | 120 mA  |
| <b>MPI</b>                                   |   |
| •Transmission rate (PPI), max.               | 187.5 kBit/s  |
| <b>1st interface</b>                         |   |
| •Physical                                    | RS 485  |
| Functionality                                |   |
| - PPI  | Yes   |
| PPI  |   |
| - Number of stations                         | 126; S7-200, OP, TP, TBP, PG/PC   |
| <b>Operator control and monitoring</b>       |   |
| Display                                      |   |
| - Type                                       | STN graphics display, LED backlighting  |
| - Number of lines                            | 2   |
| - Number of characters per line              | 20; Chars/line: ASCII, Cyrillic; 10 chars per line: Chinese   |
| - Height of characters                       | 5 mm  |
| <b>Environmental requirements</b>            |   |
| Operating temperature                        |   |
| - min.                                       | 0 °C  |
| - max.                                       | 60 °C   |
| Storage/transportation temperature           |   |
| - min.                                       | -20 °C  |
| - max.                                       | 70 °C   |
| Degree of protection and class of protection |   |
| - IP 65                                      | Yes; frontal  |
| <b>Dimensions and weight</b>                 |   |
| •Weight, approx.                             | 200 g   |
| •Width                                       | 148 mm  |
| •Height                                      | 76 mm   |
| •Depth                                       | 28 mm   |
| •Installation cutout, width                  | 138 mm  |
| •Installation cutout, height                 | 68 mm   |
| •Cabinet/control panel thickness             | 0.3 mm; 0.3 to 4 mm   |

3



- Touch panel for operator control and monitoring of small machines and plants
- Low-cost starter unit in the category of touch panels with graphics capability complete with all the basic functions required for simple tasks
- Pixel graphics 5.7" STN Touch Screen (analog/resistive), Blue-mode (4 levels)
- Specifically for SIMATIC S7-200:  
Communication to the PLC is performed via the integrated interface over a point-to-point connection
- Connected to the PLC via MPI or PROFIBUS DP cable
- The SIMATIC TP 177micro is the innovative successor to the SIMATIC TP 070/TP 170micro Touch Panels
- Ships end of 4th quarter 2004

### Configuration

Configuring is carried out with the engineering software SIMATIC WinCC flexible Micro, Compact, Standard or Advanced (see HMI software/engineering software SIMATIC WinCC flexible).

The necessary HardwareSupportPackage (HSP) can be downloaded free of charge via the following link:  
<http://www4.ad.siemens.de/WW/view/en/19241467>

Importing of TP-Designer projects (TP 070) into WinCC flexible is not possible.

A PC/PPI adaptor cable is needed to download the configuration.



# SIMATIC S7-200 Human Machine Interface

SIMATIC TP 177micro

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## Technical specifications

| Type   | TP 177micro   |
|--|---|
| <b>Display</b>   | STN liquid crystal display (LCD)                    |
| •Size  | 5.7"  |
| •Resolution (W x H in pixels)                                      | 320 x 240 (240 x 320 with vertical design)          |
| •Colors  | 4 blue levels                                       |
| •MTBF backlighting (at 25 °C)                                      | Approx. 50,000 hours                                |
| <b>Control elements</b>  | Touch screen  |
| •Numeric/alphanumeric input  | Yes / Yes <sup>1)</sup>                             |
| <b>Processor</b>   | ARM CPU   |
| <b>Memory</b>  |   |
| •Type  | Flash / RAM   |
| •Usable memory for user data                                       | 256 KB  |
| <b>Ports</b>   | 1 x RS 485  |
| <b>Interface with PLC</b>  | S7-200  |
| <b>Power supply</b>  | 24 V DC   |
| •Permitted range   | +18 V to +30 V DC                                   |
| •Nominal current   | 0.24 A  |
| <b>Clock</b>   | Software clock, without battery backup              |
| <b>Degree of protection</b>  |   |
| •Front   | IP65 (in installed state), NEMA 4, NEMA 4x, NEMA 12 |
| •Rear  | IP20  |
| <b>Certification</b>   | Available soon: FM, cULus, CE, C-Tick               |
| <b>Dimensions</b>  |   |
| •Front W x H (mm)  | 212 x 156   |
| •Cut-out W x H (mm)  | 198 x 142   |
| <b>Weight</b>  | 0.7 kg  |
| <b>Ambient conditions</b>  |   |
| •Mounting position   | Vertical <sup>2)</sup>                              |
| - Max. permissible angle of inclination without forced ventilation |   |
| •Temperature   |   |
| - Operation (vertical installation)                                | 0 °C to +50 °C <sup>2)</sup>                        |
| - Operation (max. inclination)                                     | <sup>2)</sup>                                       |
| - Transport, storage   | -20 °C to +60 °C <sup>2)</sup>                      |
| •Max. relative humidity  | <sup>2)</sup>                                       |

- 1) English font only can be displayed  
 2) Status not yet established before going to print  
 3) Not battery-backed

**Note:**  
 All specified values are maximum values.  
 The total number of configurable elements is limited by the size of the user memory.

| Type                                       | TP 177micro   |
|--|---|
| <b>Functions</b>                           |   |
| Message system                             |   |
| •No. of messages                           | 500   |
| •Bit messages                              | Yes   |
| •Analog messages                           | No  |
| •No. of process values per message         | 8   |
| •Message buffer                            | Circulating buffer, 128 entries each <sup>3)</sup>  |
| Process diagrams                           | 250   |
| •Text objects                              | 500 text elements   |
| •Variables per diagram                     | 20  |
| •Entries per diagram                       | 20  |
| •Graphics objects                          | Bitmaps, icons, background images   |
| •Dynamic objects                           | Bars  |
| - Directories                              | Yes   |
| Variables                                  | 250   |
| User administration (security)             | Yes   |
| Online languages                           | 5   |
| •Project languages (incl. system messages) | Danish, German, traditional Chinese, simplified Chinese, English, Finnish, French, Greek, Italian, Japanese, Korean, Dutch, Norwegian, Polish, Portuguese, Russian, Swedish, Spanish, Czech, Turkish, Hungarian |
| Character set                              | WinCC flexible, ideographic languages   |
| <b>Configuration tool</b>                  | From WinCC flexible 2004 Micro HSP for OP 73micro, OP 73, OP 77A, TP 177micro, TP 177A (to be ordered separately)   |
| •Configuration transfer                    | Serial via RS 485   |

# SIMATIC S7-200

## Human Machine Interface

### SIMATIC TP 177micro

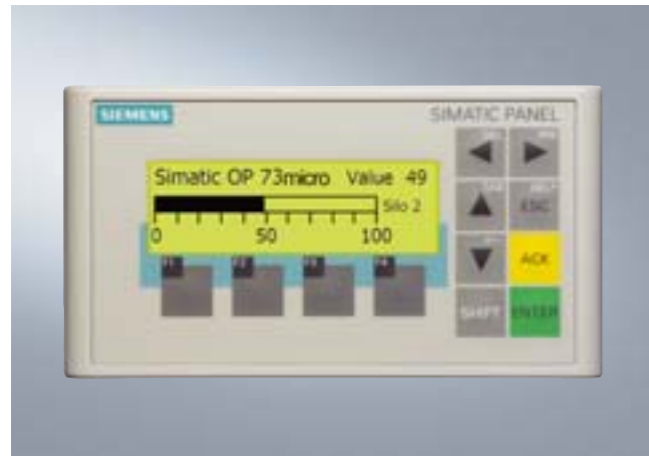
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| Ordering Data  | Order No.                  | Order No.   |
|--|----------------------------|---|
| <b>SIMATIC TP 177micro</b> <sup>E)</sup><br>Touch Panel for connection to the SIMATIC S7-200, 5.7" STN display   | <b>6AV6 640-0CA11-0AX0</b> |   |
| <b>Starter pack TP 177micro</b> <sup>E)</sup><br>comprising:<br><ul style="list-style-type: none"> <li>• TP 177micro touch panel</li> <li>• SIMATIC WinCC flexible Micro engineering software</li> <li>• SIMATIC HMI Manual Collection, 5 languages (English, German, French, Italian, Spanish) comprising all currently available user manuals, product manuals and communication manuals for SIMATIC HMI</li> <li>• MPI cable (5 m)</li> </ul>   | <b>6AV6 650-0DA01-0AA0</b> | <b>Accessories for supplementary ordering</b><br><b>Protective foil</b><br>(pack of 10) <b>6AV6 671-2XC00-0AX0</b><br><b>Service package</b><br>comprising:<br><ul style="list-style-type: none"> <li>• Gaskets</li> <li>• Clamp-type terminals</li> <li>• Plug-in terminal strip (block of two) <b>6AV6 671-2XA00-4AX0</b></li> </ul> <b>PC/PPI cable Multimaster</b> <sup>1) A)</sup> <b>6ES7 901-3CB30-0XA0</b><br>for connecting the S7-200 to serial PC/OP interface and for downloading the configuration for Micro Panels<br><b>PROFIBUS 830-1T connecting cable</b> <b>6XV1 830-1CH30</b><br>For connection of data terminal, precut/preassembled with two sub D connectors, 9-pin, 3 m<br><b>System interfaces</b> see catalog ST 80<br><b>Connecting cables</b> see catalog ST 80 |
| <b>Configuration</b><br>with SIMATIC WinCC flexible see catalog ST 80<br>HSP OP 73micro, OP 73, OP 77A, TP 177micro, TP 177A:<br><a href="http://www4.ad.siemens.de/WWW/view/en/19241467">http://www4.ad.siemens.de/WWW/view/en/19241467</a>   |                            |   |
| <b>Documentation (to be ordered separately)</b><br><b>Instruction manual OP 73micro, TP 177micro</b><br><ul style="list-style-type: none"> <li>• German <b>6AV6 691-1DF01-0AA0</b></li> <li>• English <b>6AV6 691-1DF01-0AB0</b></li> <li>• French <b>6AV6 691-1DF01-0AC0</b></li> <li>• Italian <b>6AV6 691-1DF01-0AD0</b></li> <li>• Spanish <b>6AV6 691-1DF01-0AE0</b></li> </ul> <b>User manual WinCC flexible Micro</b><br><ul style="list-style-type: none"> <li>• German <b>6AV6 691-1AA01-0AA0</b></li> <li>• English <b>6AV6 691-1AA01-0AB0</b></li> <li>• French <b>6AV6 691-1AA01-0AC0</b></li> <li>• Italian <b>6AV6 691-1AA01-0AD0</b></li> <li>• Spanish <b>6AV6 691-1AA01-0AE0</b></li> </ul> <b>SIMATIC HMI Manual Collection</b> <b>6AV6 691-1SA01-0AX0</b><br>Electronic documentation, on CD-ROM<br>5 languages (English, French, German, Italian and Spanish) comprising all currently available user manuals, product manuals and communication manuals for SIMATIC HMI |                            | 1) The PC/PPI cable with Order No. 6ES7 901-3BF21-0XA0 can also still be used<br>A) Subject to export regulations AL: N and ECCN: EAR99H<br>E) Subject to export regulations AL: N and ECCN: 5D002ENC3A   |

# SIMATIC S7-200 Human Machine Interface

## SIMATIC OP 73micro

### Overview



- Operator panel for operator control and monitoring of small machines and plants
- A new dimension in graphics: small and clever
- Pixel graphics 3" LCD, monochrome
- 8 system keys, 4 freely configurable function keys
- Specifically for SIMATIC S7-200:  
Communication with the controller is point-to-point using the integral interface
- Connected to the PLC via MPI or PROFIBUS DP cable
- Start of delivery approximately end of 4th quarter 2004

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### Technical specifications

| Type                                   | OP 73micro  |
|--|---|
| <b>Display</b>                         | LCD   |
| •Size                                  | 3"  |
| •Resolution (W x H in pixels)          | 160 x 48  |
| •Colors                                | Monochrome (yellow-green)                         |
| •MTBF of background lighting (at 25°C) | Approx. 100,000 hours                             |
| <b>Control elements</b>                | Membrane keyboard                                 |
| •Function keys, programmable           | 4 function keys                                   |
| •System keys                           | 8   |
| •Numeric/alphanumeric input            | Yes/yes <sup>1)</sup>                             |
| <b>Processor</b>                       | ARM CPU   |
| <b>Memory</b>                          |   |
| •Type                                  | Flash   |
| •Usable memory for user data           | 128 KB  |
| <b>Ports</b>                           | 1 x RS 485  |
| <b>Interface with PLC</b>              | S7-200  |
| <b>Power supply</b>                    | 24 V DC   |
| •Permitted range                       | +18 to +30 V DC                                   |
| •Nominal current                       | 0.1 A   |
| <b>Clock</b>                           | Software clock, without battery backup            |
| <b>Degree of protection</b>            |   |
| •Front                                 | IP65 (in installed state) NEMA 12, NEMA 4x, NEMA4 |
| •Rear                                  | IP20  |
| <b>Certification</b>                   | Available soon: FM, cULus, CE, C-Tick             |
| <b>Dimensions</b>                      |   |
| •Front W x H (mm)                      | 154 x 84  |
| •Cut-out W x H (mm)                    | 138 x 68  |
| <b>Weight</b>                          | 0.3 kg  |

1) English font only can be displayed

2) Status not yet established before going to print

3) Not battery-backed

Note:

All specified values are maximum values.

The total number of configurable elements is limited by the size of the user memory.

| Type   | OP 73micro  |
|--|---|
| <b>Ambient conditions</b>  |   |
| •Mounting position   | Vertical <sup>2)</sup>  |
| - max. permissible angle of inclination without forced ventilation |   |
| •Temperature   |   |
| - Operation (vertical installation)                                | 0 °C to +50 °C <sup>2)</sup>  |
| - Operation (max. inclination)                                     |   |
| - Transport, storage   | -20 °C to +70 °C <sup>2)</sup>  |
| •Max. relative humidity  |   |
| <b>Functions</b>   |   |
| Message system   |   |
| •No. of messages   | 250   |
| •Bit messages  | Yes   |
| •Number of process values per message                              | 8   |
| •Message buffer  | Circulating buffer, 128 entries each <sup>3)</sup>  |
| Process diagrams   | 250   |
| •Text objects  | 1000 text elements  |
| •Variables per diagram   | 20  |
| •Fields per diagram  | 20  |
| •Graphics objects  | 250   |
| •Dynamic objects   | Bars  |
| - Directories  | Yes   |
| Variables  | 500   |
| User administration (security)                                     | Yes   |
| Online languages   | 5   |
| Project languages (incl. system messages)                          | Danish, German, traditional Chinese, simplified Chinese, English, Finnish, French, Greek, Italian, Japanese, Korean, Dutch, Norwegian, Polish, Portuguese, Russian, Swedish, Spanish, Czech, Turkish, Hungarian |
| Character set  | WinCC flexible, ideographic languages   |
| Help system  | Yes   |
| Task planner   | Yes   |
| <b>Configuration tool</b>  |   |
|  | From WinCC flexible 2004 Micro HSP for OP 73micro, OP 73, OP 77A, TP 177micro, TP 177A (to be ordered separately)   |
| •Transfer of the configuration                                     | Serially via RS485  |

# SIMATIC S7-200

## Human Machine Interface

### SIMATIC OP 73micro

3

| Ordering Data  | Order No.  | Order No.   |
|--|--|---|
| <b>SIMATIC OP 73micro</b> <sup>E)</sup><br>Operator Panel for connecting to the SIMATIC S7-200, with 3" display, mono incl. installation accessories   | <b>6AV6 640-0BA11-0AX0</b>   | <b>Accessories for supplementary ordering</b><br><br><b>Service package</b><br>comprising:<br>•Gaskets<br>•5 clamps<br>•Clamp-type terminal strip (block of two)  |
| <b>Starter pack OP 73micro</b> <sup>E)</sup><br>comprising:<br>•Operator Panel OP 73micro<br>•SIMATIC WinCC flexible Micro engineering software<br>•SIMATIC HMI Manual Collection, 5 languages (English, German, French, Italian, Spanish), comprising all currently available user manuals, product manuals and communication manuals for SIMATIC HMI<br>•MPI cable (5 m) | <b>6AV6 650-0BA01-0AA0</b>   |   |
| <b>Configuration</b><br>with SIMATIC WinCC flexible HSP OP 73micro, OP 73, OP 77A, TP 177micro, TP 177A:<br><a href="http://www4.ad.siemens.de/WW/view/en/19241467">http://www4.ad.siemens.de/WW/view/en/19241467</a>  | see catalog ST 80  | <b>PC/PPI Multimaster cable</b> <sup>1) A)</sup><br>For connecting the S7-200 to serial PC/OP interface and for downloading the configuration for Micro Panels  |
| <b>Documentation (to be ordered separately)</b><br><br><b>Instruction manual OP 73micro/TP 177micro</b> <sup>1)</sup><br>•German<br>•English<br>•French<br>•Italian<br>•Spanish  | <b>6AV6 691-1DF01-0AA0</b><br><b>6AV6 691-1DF01-0AB0</b><br><b>6AV6 691-1DF01-0AC0</b><br><b>6AV6 691-1DF01-0AD0</b><br><b>6AV6 691-1DF01-0AE0</b> | <b>PROFIBUS 830-1T connecting cable</b><br>For connection of data terminal, precut/preassembled with two sub D connectors, 9-pin, terminated at both ends, 3 m  |
| <b>User manual WinCC flexible Micro</b><br>•German<br>•English<br>•French<br>•Italian<br>•Spanish  | <b>6AV6 691-1AA01-0AA0</b><br><b>6AV6 691-1AA01-0AB0</b><br><b>6AV6 691-1AA01-0AC0</b><br><b>6AV6 691-1AA01-0AD0</b><br><b>6AV6 691-1AA01-0AE0</b> | <b>System interfaces</b><br>see catalog ST 80<br><br><b>Connecting cables</b><br>see catalog ST 80  |
| <b>SIMATIC HMI Manual Collection</b><br>Electronic documentation, on CD-ROM<br>5 languages (English, French, German, Italian and Spanish);<br>Comprising: all currently available user manuals, product manuals and communication manuals for SIMATIC HMI  | <b>6AV6 691-1SA01-0AX0</b>   | 1) The PC/PPI cable with Order No. 6ES7 901-3BF21-0XA0 can also still be used<br>A) Subject to export regulations AL: N and ECCN: EAR99H<br>E) Subject to export regulations AL: N and ECCN: 5D002ENC3A |

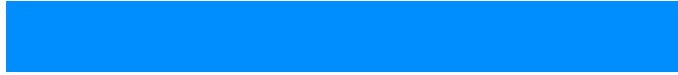
### Overview

- Software for the SIMATIC S7-200
- Functions for all phases of an automation project:
  - Planning, configuring and parameterization of hardware and communication
  - Creation of a user program
  - Documentation
  - Testing, commissioning and service
  - Process control
  - Archiving

The following are available:

- STEP 7- Micro/WIN
- STEP 7 Micro/WIN command library
- WinCC flexible micro
- S7-200 PC-Access

For further information see section 7.









#### **S7-300**

- The modular mini PLC system for the low and medium performance ranges
- With comprehensive range of modules for optimum adaptation to the automation task
- Flexible use through simple implementation of distributed structures and versatile networking
- Convenient system as result of user-friendly handling and uncomplicated, fan-free configuration
- Can be expanded without problems when the tasks increase
- Powerful thanks to a large number of integrated functions

#### **S7-300F**

- Failsafe automation system for plants with increased safety requirements for production engineering
- Based on S7-300
- ET 200S and ET 200M distributed I/O stations with safety-relevant modules can also be connected; safety-relevant communication via PROFIBUS DP with PROFISAFE profile.
- Standard modules can be used in addition for non-safety-relevant applications

#### **SIPLUS S7-300**

- The PLC for use in the harshest environmental conditions
- With extended temperature range from -25 to +70°C
- Suitable for extraordinary medial load (pollution gas atmosphere)
- Occasional short-term condensation and increased mechanical loading permissible
- With the proven PLC technology of the S7-300
- Convenient handling, programming, maintenance and service
- Ideal for use in the automotive industry, environmental technology, mining, chemical plants, production technology, food industry etc.
- The alternative to expensive custom solutions

More Information you can find at:

<http://www.siemens.com/siplus>

#### Technical specifications

##### General technical specifications S7-300, S7-300F

|  |   |
|--|---|
| Degree of protection                         | Degree of protection<br>IP20 to IEC 60 529  |
| Ambient temperature                          | 0 to 60 °C  |
| •With horizontal mounting                    | 0 to 60 °C  |
| •With vertical mounting                      | 0 to 40 °C  |
| Relative humidity                            | 5 to 95%, no condensation<br>(RH severity level 2 in accordance with IEC 61131-2)   |
| Atmospheric pressure                         | 795 to 1080 hPa   |
| Isolation                                    | Test voltage 500 V DC<br>Test voltage 1460 V AC   |
| •24 V DC circuits                            |   |
| •230 V AC circuits                           |   |
| Electromagnetic compatibility                | Requirements of EMC law;<br>Noise immunity according to IEC 61000-6-2, tested according to: IEC 61000-4-2, 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6<br><br>Emitted interference according to EN 50081-2, tested according to EN 55011, class A, group 1 |
| Mechanical rating                            |   |
| •Vibrations, tested according to/tested with | IEC 60068, Part 2-6/10 up 58 Hz; constant amplitude 0.075 mm; 58 to 150 Hz; constant acceleration 1 g; oscillation period: 10 frequency cycles per axis in each direction of the 3 mutually perpendicular axes  |
| •Shock, tested according to/tested with      | IEC 60068, Part 2-27/half-sine: strength of impact 15 g (peak value), duration 11 ms  |

##### General technical specifications SIPLUS S7-300

|  |   |
|--|---|
| <b>Ambient temperature</b>                 |   |
| Temperature                                | Horizontal mounting:<br>-25 °C to 70 °C<br>Vertical mounting:<br>-25 °C to 50 °C  |
| Relative humidity                          | 5 to 95%; transient condensation permissible, corresponding to relative humidity (RH-) stress grade 2 according to IEC 1131-2 and IEC 721 3-3 Cl. 3K5   |
| Transient icing                            | -25 °C to 0 °C<br>IEC 721 3-3 Cl. 3K5   |
| Atmospheric pressure                       | 1080 to 795 hPa corresponding to a height of -1000 to 2000 m  |
| Pollutant concentration                    | SO <sub>2</sub> : < 0,5 ppm; relative humidity <60% Test: 10 ppm, 4 days<br>H <sub>2</sub> S: < 0,1 ppm; relative humidity <60% Test: 1 ppm, 4 days (according to IEC 721 3-3; Class 3C3)   |
| <b>Mechanical environmental conditions</b> |   |
| Vibrations                                 | Type of vibration: frequency progressions changing at 1 octave per minute. 2 Hz ≤ f ≤ 9 Hz, constant amplitude 3,0 mm<br>9 Hz ≤ f ≤ 150 Hz, constant acceleration 1 g;<br>Duration of vibration: 10 frequency progressions per axis in each direction of the three mutually perpendicular axes;<br>Vibration testing according to IEC 68 section 2-6 (Sinus) and IEC 721 3-3, Class 3M4 |
| Shock                                      | Type of shock: semisinusoidal shock strength: 15 g peak value, duration shock direction 11 ms: 3 shocks each in +/- direction on each of the mutually perpendicular axes Shock testing according to IEC 68 section 2-27   |
| Conformity                                 | EN 50155<br>(railroad applications - electronic device on rail vehicles)  |

4

#### CPU 312C



- The compact CPU with integrated digital inputs and outputs
- For small applications with high requirements in terms of processing power
- With process-related functions

*Micro memory card required to operate the CPU.*

#### CPU 313C-2 PtP



- The compact CPU with integrated digital I/Os and second serial interface
- For installations with high requirements in terms of processing power and response time.
- With process-related functions

*Micro memory card required to operate the CPU.*

#### CPU 313C



- The compact CPU with integrated digital and analog inputs and outputs
- For installations with high requirements in terms of processing power and response time.
- With process-related functions

*Micro memory card required to operate the CPU.*

#### CPU 313C-2 DP



- The compact CPU with integrated digital I/Os and PROFIBUS DP master/slave interface
- With process-related functions
- For tasks with special functions
- For the connection of standalone I/O devices

*Micro memory card required to operate the CPU.*

# SIMATIC S7-300

## Central processing units

CPU 312C to CPU 317F-2 DP

### CPU 314C-2 PtP



- The compact CPU with integrated digital and analog I/Os, as well as a second serial interface
- For installations with high requirements in terms of processing power and response time
- With process-related functions

*Micro memory card required to operate the CPU.*

### CPU 312



- The starter CPU for Totally Integrated Automation (TIA).
- For small-scale applications with moderate requirements on the processing speed.

*Micro memory card required to operate the CPU.*

4

### CPU 314C-2 DP



- The compact CPU with integrated digital and analog I/Os and PROFIBUS DP master/slave interface
- With process-related functions
- For tasks with special functions
- For the connection of standalone I/O devices

*Micro memory card required to operate the CPU.*

### CPU 314



- For installations with medium requirements on program scope
- High processing performance in binary and floating-point arithmetic

*Micro memory card is required to operate the CPU.*

#### CPU 315-2 DP



- The CPU with medium to large program memory and quantity framework for the use, if required, of SIMATIC Engineering Tools
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For extensive I/O configurations
- For setting up distributed I/O structures

*Micro memory card required for operation of CPU.*

#### CPU 318-2 DP



- The CPU with a large program memory and PROFIBUS DP master/slave interface
- For extensive I/O configurations
- For setting up distributed I/O structures

#### CPU 317-2 DP



- The CPU with a large program memory and quantity framework for demanding requirements
- For multisector automation tasks in the construction of series machines, special machines and plants
- Used as a central controller on production lines with central and distributed I/O
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For extensive I/O configurations
- For setting up distributed I/O structures
- Supports as an option the use of SIMATIC Engineering Tools
- Distributed intelligence in Component based Automation (CBA) on PROFIBUS DP

*Micro memory card required for operation of CPU.*

#### CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding requirements
- Distributed intelligence in Component based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component based Automation (CBA)
- PROFINET I/O controller for operating distributed I/O on PROFINET
- For multisector automation tasks in the construction of series machines, special machines and plants
- Used as a central controller on production lines with central and distributed I/O
- For extensive I/O configurations
- For setting up distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP-master/slave interface
- Supports as an option the use of SIMATIC Engineering Tools

*Micro memory card required for operation of CPU.*

# SIMATIC S7-300

## Central processing units

CPU 312C to CPU 317F-2 DP

CPU 317T-2 DP



- SIMATIC CPU with integrated technology/motion control functionality
- With the full functionality of the standard CPU 317-2 DP
- For multisector automation tasks in the construction of series machines, special machines and plants
- Ideal for synchronized motion sequences such as a coupling to a virtual/real master, gearbox synchronism, cam disc or print-mark correction.
- Used as a central controller on production lines with central and distributed I/O
- Distributed intelligence in Component Based Automation (CBA) on PROFIBUS DP
- With onboard I/O for fast technological functions (e.g., cam switching, reference point detection)
- PROFIBUS DP (DRIVE) interface for the isochronous connection of drive components.
- A common S7 application program for control and motion control tasks (no additional programming language for motion control required)
- Optional "S7 Technology" package required

CPU 315F-2 DP



- For configuration of a failsafe automation system for plants with increased safety requirements
- Based on the SIMATIC CPU 315-2 DP
- With 2 interfaces (1x MPI, 1x DP/MPI)
- Complies with safety requirements up to SIL 3 to IEC 61508, AK6 to DIN V 19250 and Cat. 4 to EN 954-1
- Without additional wiring of safety-relevant I/O
- Safety-relevant communication via PROFIBUS DP with PROFISAFE profile with distributed I/O stations
- Distributed connection of failsafe ET200S PROFISAFE I/O modules possible; Central and distributed connection of failsafe ET200M I/O modules possible
- Central and distributed use of standard modules for non-safety-relevant applications

*Micro memory card required for operation of CPU.*

4

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