
Catalog News ST 70 N · 2008

# simatic

Products for
Totally Integrated Automation
and Micro Automation

SIEMENS

## Related catalogs

**SIMATIC** ST 70
Products for
Totally Integrated Automation
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Order No.:
E86060-K4670-A101-B1-7600


**Industrial Communication** IK PI
Industrial Communication for
Automation and Drives

Order No.:
E86060-K6710-A101-B5-7600


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**SIMATIC sensors** FS 10
Sensors for
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**Information and Training** ITC
SITRAIN Training for Automation
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Order No.:
E86060-K6850-E101-B8
(in German)


**Catalog CA 01** CA 01
The offline Mall of
Automation and Drives

Order No.:
CD: E86060-D4001-A110-C6-7600
DVD: E86060-D4001-A510-C6-7600

**A&D Mall**

Internet:
www.siemens.com/automation/mall

# Products for Totally Integrated Automation and Micro Automation

## Catalog News ST 70 N · 2008


The products contained in this catalog can also be found in the e-Catalog CA 01
Order No.:
E86060-D4001-A110-C6-7600 (CD-ROM)
E86060-D4001-A510-C6-7600 (DVD)

Please contact your local Siemens branch



*The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001 (Certified Registration No. 1323-QM). The certificate is recognized by all IQNet countries.*

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**Notes on this Catalog:**

- The Catalog News ST 70 N · 2008 is a supplement to the Catalog ST 70 · 2007.
  It contains new products as well as updated technical and ordering data.
- Catalog ST 70 · 2007 remains valid.

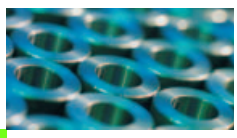
# Siemens Automation and Drives. Welcome

More than 70,000 people aiming for the same goal: increasing your competitiveness. That's Siemens Automation and Drives.

We offer you a comprehensive portfolio for sustained success in your sector, whether you're talking automation engineering, drives or electrical installation systems. Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) form the core of our offering. TIA and TIP are the basis of our integrated range of products and systems for the manufacturing and process industries as well as building automation. This portfolio is rounded off by innovative services over the entire life cycle of your plants.

Learn for yourself the potential our products and systems offer. And discover how you can permanently increase your productivity with us.

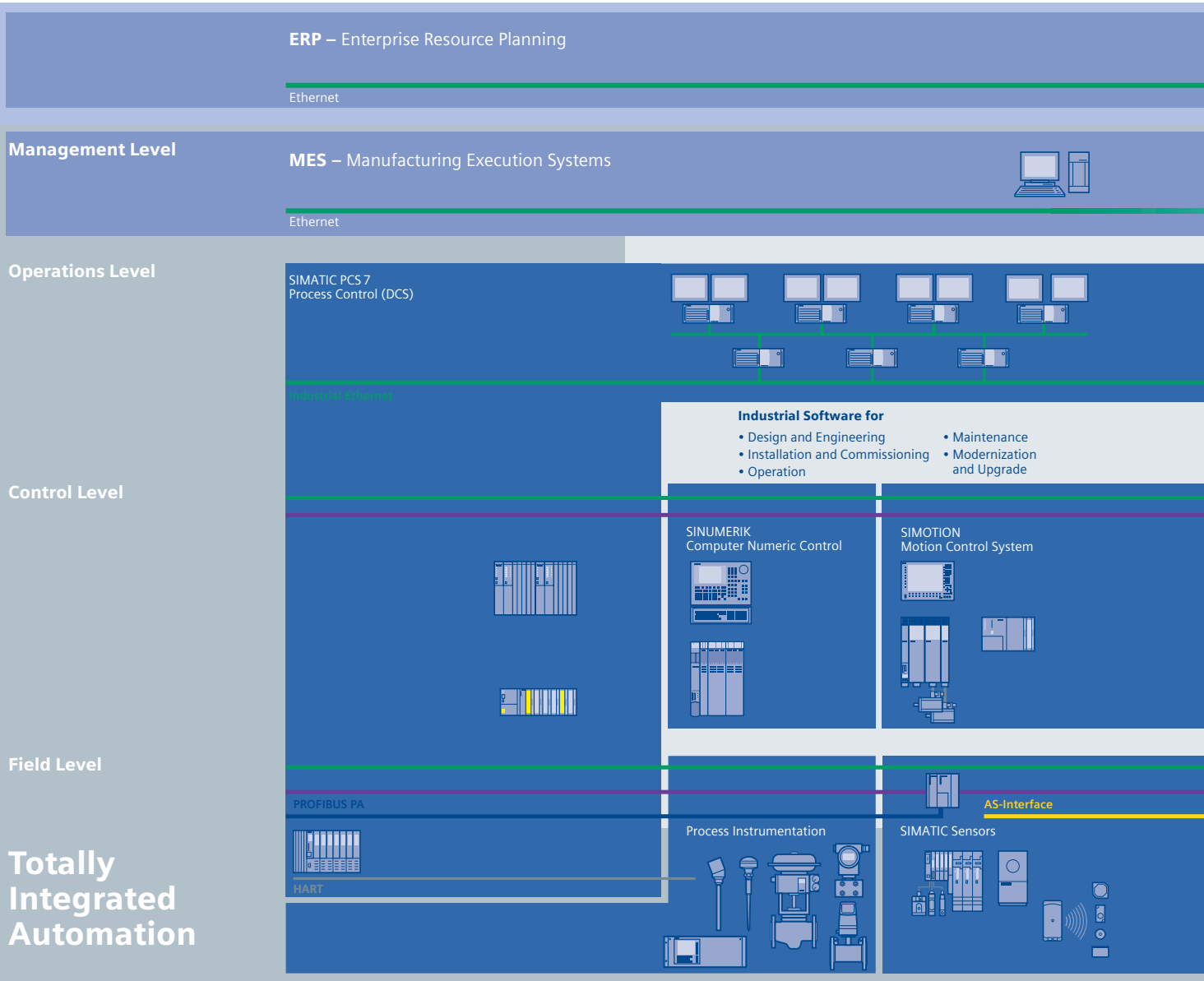
Your regional Siemens contact can provide more information. He or she will be glad to help.



# Sharpen your competitive edge. Totally Integrated Automation

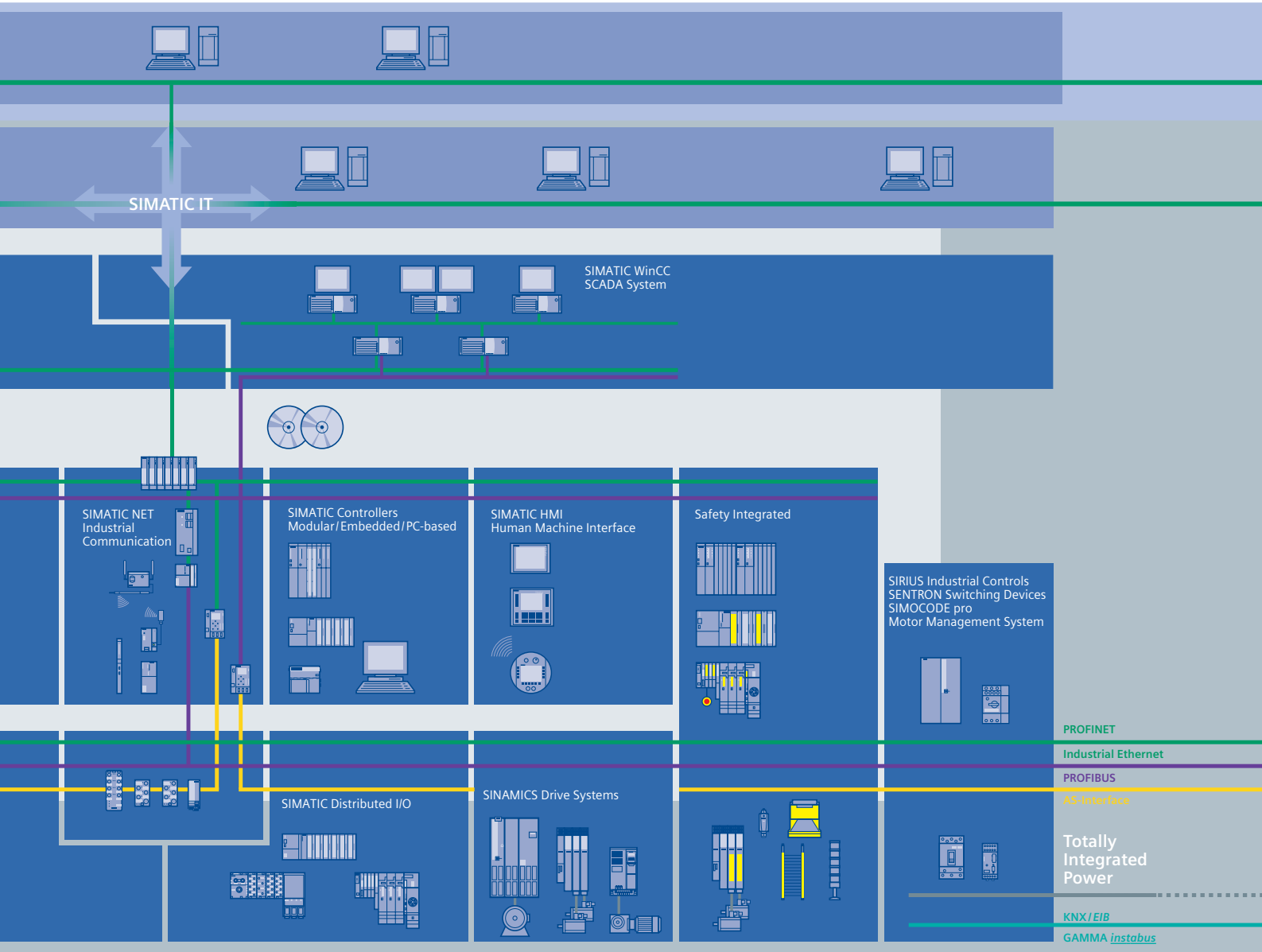
With Totally Integrated Automation (TIA), Siemens is the only manufacturer to offer an integrated range of products and systems for automation in all sectors - from incoming goods to outgoing goods, from the field level through the production control level to connection with the corporate management level.

On the basis of TIA, we implement solutions that are perfectly tailored to your specific requirements and are characterized by a unique level of integration. This integration not only ensures significant reductions in interface costs but also guarantees the highest level of transparency across all levels.



It goes without saying that you profit from Totally Integrated Automation during the entire life cycle of your plants - from the first planning steps, through operation, right up to modernization. Consistent integration in the further development of our products and systems guarantees a high degree of investment security here.

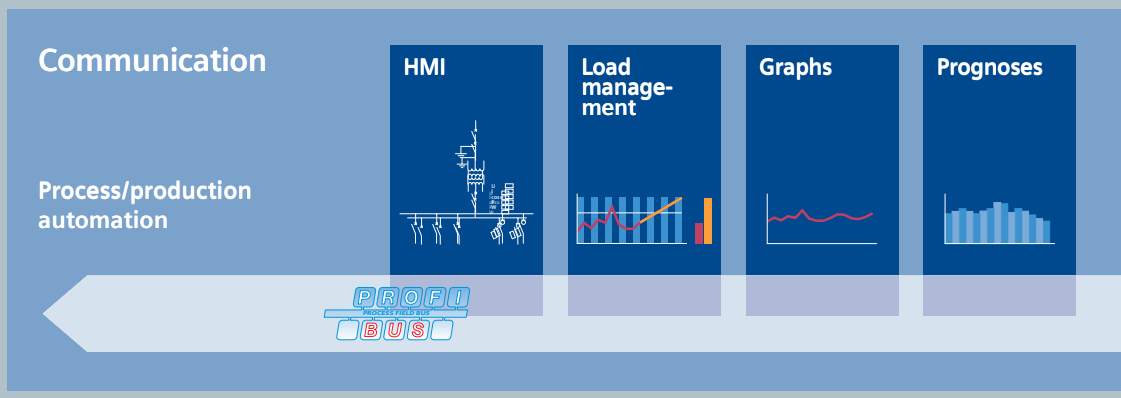
Totally Integrated Automation makes a crucial contribution towards optimizing everything that happens in the plant and thus creates the conditions for a significant increase in productivity.

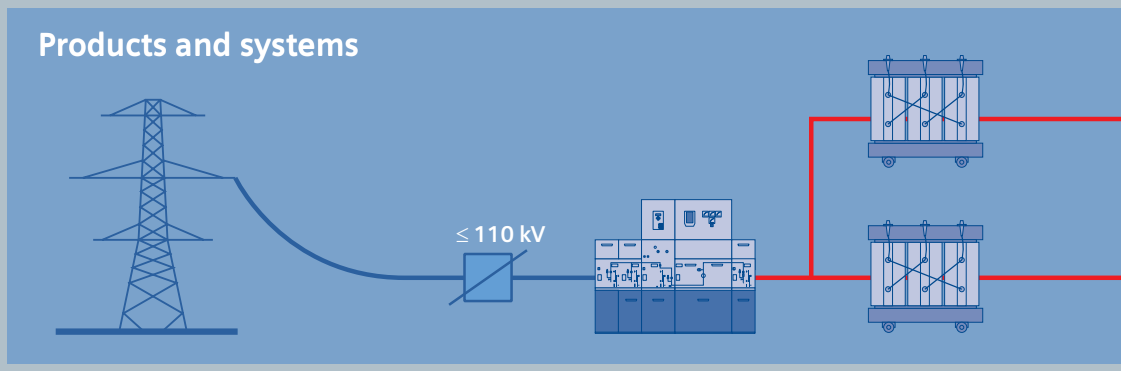


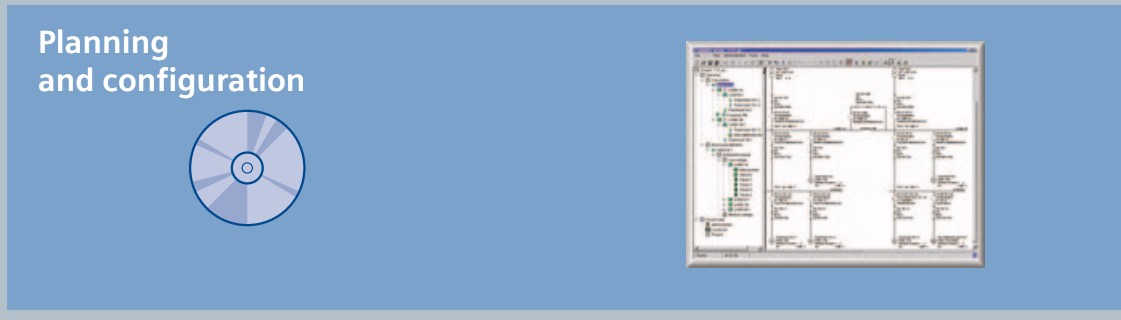
# Integrated energy distribution from a single source. Totally Integrated Power

Totally Integrated Power (TIP) brings together all the components of electrical energy distribution into an integrated whole. Thus TIP provides the answer to growing market demands in the planning, construction and use of utility buildings and industrial buildings.

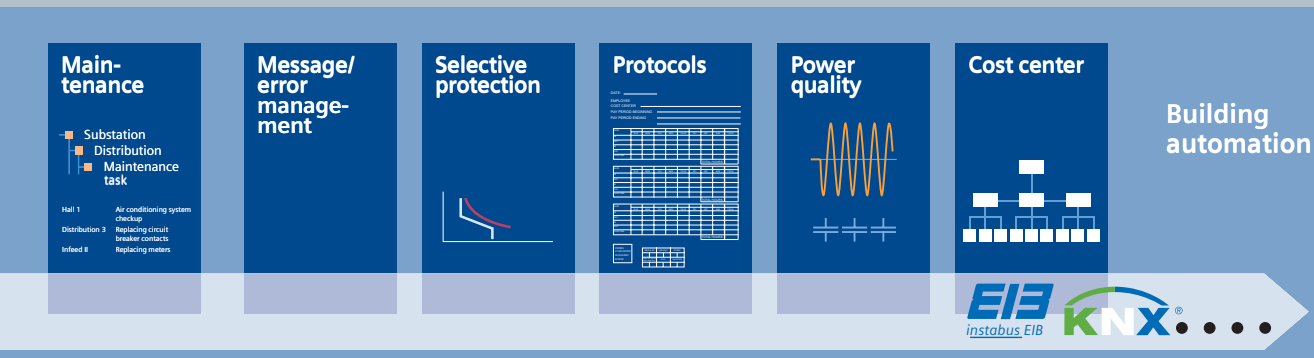
On the basis of TIP, we offer integrated solutions for energy distribution, from medium voltage to the power outlet. Totally Integrated Power is based here on integration in planning and configuring as well as on perfectly matched products and systems.

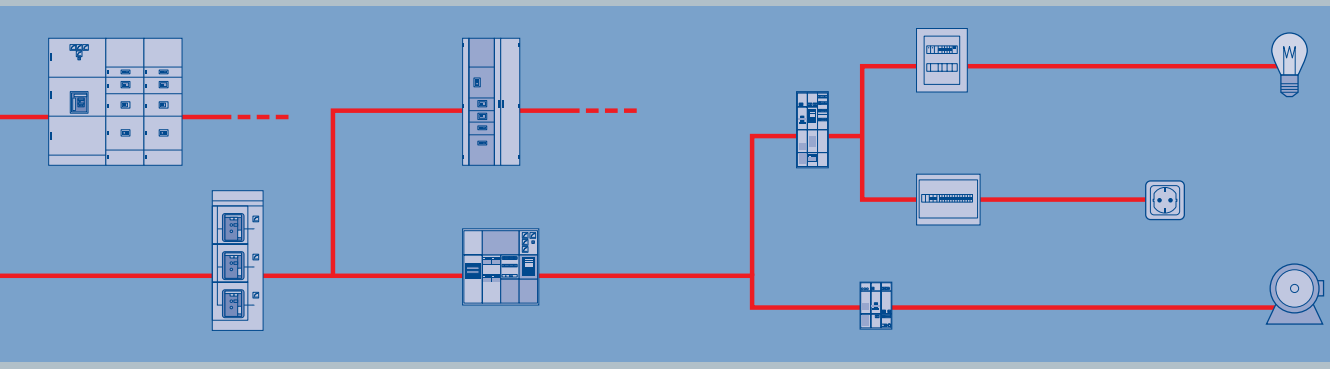


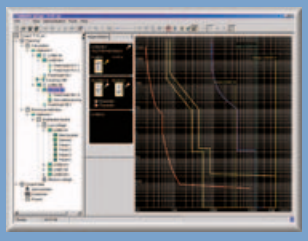



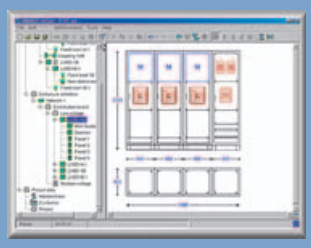



Totally Integrated Power offers communication and software modules for connecting the energy distribution systems to industrial automation and building automation. This enables the implementation of significant savings potential.







# Protecting the environment and resources. Environmental sustainability

Environmental protection will continue to grow in importance as a result of progressive urbanization and global population growth. These global mega-trends make the careful and sustainable handling of natural resources a central challenge.

We are convinced that every individual - and especially every company - has an ecological responsibility. At Siemens Automation and Drives, we stand by this conviction. Our high environmental protection goals are part of our strict environmental management. We investigate the possible effects of our products and systems on the environment right back at the development stage. We concern ourselves, for example, with the question of how to reduce power consumption in plant operation - and we offer appropriate solutions, such as our energy-saving motors that cut power consumption in industrial manufacturing by up to 40% thanks to their high efficiency levels.

Our products and systems comply with the EC Directive RoHS (Restriction of Hazardous Substances). All the relevant Siemens AG sites are, of course, certified in accordance with DIN EN ISO 14001.

Our commitment goes well beyond compliance with the relevant directives and legislation: we are an active driving force behind environmental protection, through further development of environmental management systems, for example, and we are involved in professional associations such as the German Electrical and Electronic Manufacturers Association (ZVEI).

# SIMATIC S7-200

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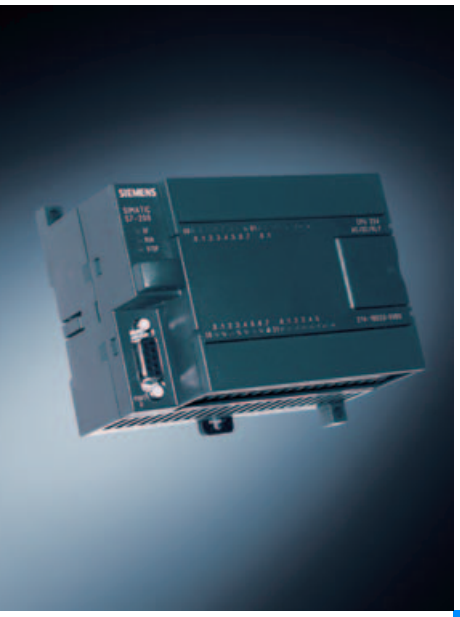




***Brochures***

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

## EM 223 digital input/output modules



### 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 and outputs

### Technical specifications

| | 6ES7 223-1BM22-0XA0 | 6ES7 223-1PM22-0XA0 |
|---|---|---|
| **Voltages and currents** | | |
| Load voltage L+ | | |
| • Rated value (DC) | 24 V | 24 V |
| • permissible range, lower limit (DC) | 20.4 V | 5 V |
| • permissible range, upper limit (DC) | 28.8 V | 30 V |
| Load voltage L1 | | |
| • Rated value (AC) | | 230 V; 24 to 230 V AC |
| • permissible range, lower limit (AC) | | 5 V |
| • permissible range, upper limit (AC) | | 250 V |
| **Current consumption** | | |
| from backplane bus DC 5 V, max. | 240 mA | 205 mA |
| from coil current, max. | | 9 mA; for each output on signal "1" |
| from sensor current supply or external current supply (24 V DC), max. | 128 mA; ON: 4 ma/input | 128 mA |
| Power loss, typ. | 9 W | 13 W |
| **Connection point** | | |
| pluggable I/O terminals | Yes | Yes |
| **Digital inputs** | | |
| Number of digital inputs | 32 | 32 |
| Input voltage | | |
| • Rated value, DC | 24 V | 24 V |
| • for signal "0" | 0 to 5 V | 0 to 5 V |
| • for signal "1" | 15 to 30 V DC | 15 to 30 V DC |
| Input current | | |
| • for signal "1", typ. | 4 mA | 4 mA |

| | 6ES7 223-1BM22-0XA0 | 6ES7 223-1PM22-0XA0 |
|---|---|---|
| Input delay (for rated value of input voltage) | | |
| • for standard inputs - at "0" to "1", max. | 4.5 ms | 4.5 ms |
| **Digital outputs** | | |
| Number of digital outputs | 32 | 32; Relay |
| Cable length, shielded, max. | 500 m | 500 m |
| Cable length unshielded, max. | 150 m | 150 m |
| Short-circuit protection of the output | No; to be provided externally | No; to be provided externally |
| Limitation of inductive shut-down voltage to | L+ (-48 V) | |
| Output voltage | | |
| • for signal "0" (DC), max. | 0.1 V | 0.1 V; with 10 kOhm load |
| • for signal "1", min. | 20 V | L+ / L1 |
| Output current | | |
| • for signal "1" rated value | 750 mA | 2,000 mA |
| Aggregate current of the outputs (per group) | | |
| • maximum current per conductor/group | 0.75 A; 10 A per group | 2 A; 10 A per group |
| **Relay outputs** | | |
| Number of operating cycles | | 10,000,000; mechanically 10 million, at rated load voltage 100,000 |
| Switching capacity of the contacts | | |
| • with inductive load, max. | 0.75 A; each output | 0.75 A; each output |
| • on lamp load, max. | 5 W | 200 W; 30 W DC; 200 W AC |
| • with resistive load, max. | 0.75 A; each output | 2 A; each output |

## Technical specifications (continued)

| | 6ES7 223-1BM22-0XA0 | 6ES7 223-1PM22-0XA0 |
|---|---|---|
| **Encoder** | | |
| Connectable encoders | | |
| • 2-wire BEROS | Yes | Yes |
| • permissible quiescent current (2-wire BEROS), max. | 1 mA | 1 mA |
| **Isolation** | | |
| Isolation checked with | 500 V AC | 500 V AC |
| **Isolation** | | |
| Galvanic isolation, digital inputs | | |
| • Galvanic isolation, digital inputs | Yes; Optocoupler | Yes; Optocoupler |
| • between the channels, in groups of | 16; 2 groups with 16 inputs each | 16 |

| | 6ES7 223-1BM22-0XA0 | 6ES7 223-1PM22-0XA0 |
|---|---|---|
| Isolation, digital outputs | | |
| • Galvanic isolation, digital outputs | Yes; Optocoupler | Yes; Relay |
| • between the channels, in groups of | 16; 2 groups with 16 outputs each | 11; 11/11/10 |
| **Dimensions** | | |
| Width | 196 mm | 196 mm |
| Height | 80 mm | 80 mm |
| Depth | 62 mm | 62 mm |
| **Weights** | | |
| Weight, approx. | 500 g | 580 g |

## Ordering Data

| | | Order No. |
|---|---|---|
| **Digital input/output module EM 223** | | |
| For CPU 221/222/224/224 XP/226 | | |
| • 32 inputs, 24 V DC, 32 outputs, 24 V DC; 0.75 A, isolated | A) | **6ES7 223-1BM22-0XA0** |
| • 32 inputs, 24 V DC, 32 outputs, relay | A) | **6ES7 223-1PM22-0XA0** |
| **Front flap set** | | |
| Contains different cover flaps for CPU and EM; spare part | A) | **6ES7 291-3AX20-0XA0** |
| **Plug-in terminal block (spare part)** | A) | **6ES7 292-1AE20-0AA0** |
| • With 12 terminals (for EM 223) | | |

| | | Order No. |
|---|---|---|
| **Simulator SIM 274 (optional)** | | |
| With 8 terminals for EM 221 and EM 223 | A) | **6ES7 274-1XF00-0XA0** |
| **S7-200 programmable controller, System Manual** | | |
| For CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4 | | |
| German | | **6ES7 298-8FA24-8AH0** |
| English | | **6ES7 298-8FA24-8BH0** |
| French | | **6ES7 298-8FA24-8CH0** |
| Spanish | | **6ES7 298-8FA24-8DH0** |
| Italian | | **6ES7 298-8FA24-8EH0** |
| Chinese | | **6ES7 298-8FA24-8FH0** |

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

# SIMATIC S7-300

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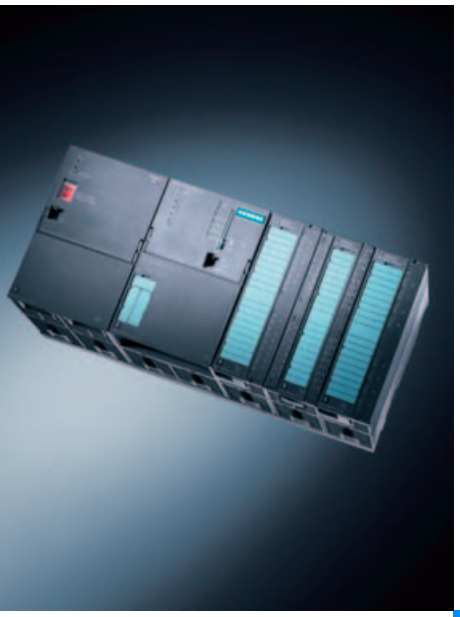




***Brochures***

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http://www.siemens.com/simatic/printmaterial

# Fail-safe CPU 319F-3 PN/DP



## Overview

- The fail-safe CPU with high-performance command processing, large program memory and large quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and up to Cat. 4 acc. to EN 954-1
- Fail-safe I/O modules can be connected decentralized over the integrated PROFINET interface (PROFIsafe) and/or over the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe I/O modules of ET 200M can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and decentralized
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- Isochronous mode on PROFIBUS
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

For operation of the CPU, a micro memory card is required.

## Technical specifications

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| **Product status** | |
| associated programming package | STEP 7 V5.4 or higher, Service Pack 2 with HSP 143 |
| **Supply voltages** | |
| Rated value | |
| • 24 V DC | Yes |
| • permissible range, lower limit (DC) | 20.4 V |
| • permissible range, upper limit (DC) | 28.8 V |
| **Voltages and currents** | |
| External protection for supply cables (recommendation) | min. 2 A |
| **Current consumption** | |
| Inrush current, typ. | 4 A |
| $I^2t$ | 1.2 $A^2s$ |
| Current consumption (in no-load operation), typ. | 400 mA |
| Current consumption (rated value) | 1,050 mA |
| Power loss, typ. | 14 W |
| **Memory** | |
| Type of storage | |
| • RAM | |
| - integrated | 1,400 KByte |
| - expandable | No |
| • Load memory | |
| - pluggable (MMC) | Yes |
| - pluggable (MMC), max. | 8 MByte |

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| Backup | |
| • present | Yes; up to 700 KB, maintenance-free |
| • without battery | Yes; program and data |
| **CPU/blocks** | |
| DB | |
| • Number, max. | 4,095; DB 0 reserved |
| • Size, max. | 64 KByte |
| FB | |
| • Number, max. | 2,048; from FC 0 to FC 2047 |
| • Size, max. | 64 KByte |
| FC | |
| • Number, max. | 2.048; from FC 0 to FC 2047 |
| • Size, max. | 64 KByte |
| OB | |
| • Size, max. | 64 KByte |
| Nesting depth | |
| • per priority class | 16 |
| • additional within an error OB | 4 |
| **CPU/processing times** | |
| for bit operations, min. | 0.01 µs |
| for word operations, min. | 0.02 µs |
| for fixed point arithmetic, min. | 0.02 µs |
| for floating point arithmetic, min. | 0.1 µs |

## Technical specifications (continued)

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| **Times/counters and their remanence** | |
| S7 counter | |
| • Number | 2,048 |
| • Remanence | |
| - adjustable | Yes |
| • Counting range | |
| - adjustable | Yes |
| - lower limit | 0 |
| - upper limit | 999 |
| IEC counter | |
| • present | Yes |
| • Type | SFB |
| S7 times | |
| • Number | 2,048 |
| • Remanence | |
| - adjustable | Yes |
| - preset | No retentivity |
| • Time range | |
| - lower limit | 10 ms |
| - upper limit | 9,990 s |
| IEC timer | |
| • present | Yes |
| • Type | SFB |
| **Data areas and their remanence** | |
| Flag | |
| • Number, max. | 8 KByte |
| • Remanence available | Yes; MB 0 to MB 8191 |
| • Number of clock memories | 8; 1 memory byte |
| Data blocks | |
| • Number, max. | 4,095; from DB 1 to DB 4095 |
| • Size, max. | 64 KByte |
| • Remanence adjustable | Yes; via non-retain property on DB |
| • Remanence preset | Yes |
| Local data | |
| • per priority class, max. | 1,024 Byte |
| **Address area** | |
| I/O address area | |
| • Inputs | 8 KByte |
| • Outputs | 8 KByte |
| • of which, distributed | |
| - Inputs | 8 KByte |
| - Outputs | 8 KByte |
| Process image | |
| • Inputs, adjustable | 2 KByte |
| • Outputs, adjustable | 2 KByte |
| • Inputs, preset | 1,024 Byte |
| • Outputs, preset | 1,024 Byte |

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| Subprocess images | |
| • Number of subprocess images, max. | 1 |
| Digital channels | |
| • Inputs | 65,536 |
| • Outputs | 65,536 |
| • Inputs, of which central | 1,024 |
| • Outputs, of which central | 1,024 |
| Analog channels | |
| • Inputs | 4,096 |
| • Outputs | 4,096 |
| • Inputs, of which central | 256 |
| • Outputs, of which central | 256 |
| **Hardware configuration** | |
| Racks, max. | 4 |
| Modules per rack, max. | 8 |
| Number of DP masters | |
| • integrated | 2 |
| • via CP | 4 |
| Number of operable FMs and CPs (recommended) | |
| • FM | 8 |
| • CP, point-to-point | 8 |
| • CP, LAN | 10 |
| **Time** | |
| Clock | |
| • Hardware clock (real-time clock) | Yes |
| • buffered and synchronizable | Yes |
| • Deviation per day, max. | 10 s |
| Operating hours counter | |
| • Number | 4 |
| • Number/Number range | 0 to 3 |
| • Range of values | 0 to 2^31 hours (when using SFC 101) |
| • Granularity | 1 hour |
| • remanent | Yes; must be restarted at each warm restart |
| Clock synchronization | |
| • supports | Yes |
| • to MPI, Master | Yes |
| • to MPI, Slave | Yes |
| • to DP, Master | Yes |
| • to DP, Slave | Yes; on DP slave only time-of-day slave |
| • in AS, Master | Yes |
| • in AS, Slave | Yes |
| • on Ethernet via NTP | Yes; as client |

## Fail-safe CPU 319F-3 PN/DP



### Technical specifications (continued)

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| **S7 message functions** | |
| Number of login stations for message functions, max. | 32; depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages | Yes |
| Simultaneously active Alarm-S blocks, max. | 60 |
| **Test commissioning functions** | |
| Status/control | |
| • Status/control variable | Yes |
| • Variables | Inputs, outputs, memory bits, DB, times, counters |
| • Number of variables, max. | 30 |
| • of which status variable, max. | 30 |
| • of which control variable, max. | 14 |
| Forcing | |
| • Forcing | Yes |
| • Force, variables | Inputs, outputs |
| • Number of variables, max. | 10 |
| Status block | Yes |
| Single step | Yes |
| Number of breakpoints | 2 |
| Diagnostic buffer | |
| • present | Yes |
| • Number of entries, max. | 500 |
| **Communication functions** | |
| PG/OP communication | Yes |
| Routing | Yes |
| Global data communication | |
| • supported | Yes |
| • Size of GD packets, max. | 22 Byte |
| S7 basic communication | |
| • supported | Yes |
| S7 communication | |
| • supported | Yes |
| S5-compatible communication | |
| • supported | Yes; via CP and loadable FC |
| Open IE communication | |
| • TCP/IP | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max. | 8 |
| - Data length, max. | 1,460 Byte |
| • ISO-on-TCP (RFC1006) | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max. | 8 |
| - Data length, max. | 8,192 Byte |
| • UDP | Yes; via integrated PROFINET interface and loadable FBs |
| - Number of connections, max. | 8 |
| - Data length, max. | 1,472 Byte |

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| Number of connections | |
| • overall | 32 |
| • usable for PG communication | 31 |
| • usable for OP communication | 31 |
| • usable for S7 basic communication | 30 |
| PROFINET CBA (at set setpoint communication load) | |
| • Setpoint for the CPU communication load | 20% |
| • Number of remote interconnection partners | 32 |
| • Number of functions, master/slave | 50 |
| • Total of all master/slave connections | 3.000 |
| • Data length of all incoming connections master/slave, max. | 24,000 Byte |
| • Data length of all outgoing connections master/slave, max. | 24,000 Byte |
| • Number of device-internal and PROFIBUS interconnections | 1,000 |
| • Data length of device-internal and PROFIBUS interconnections, max. | 8,000 Byte |
| • Data length per connection, max. | 1,400 Byte |
| • Remote interconnections with acyclic transmission | |
| - Sampling frequency: sampling interval, min. | 200 ms |
| - Number of incoming interconnections | 100 |
| - Number of outgoing interconnections | 100 |
| - Data length of all incoming interconnections, max. | 3,200 Byte |
| - Data length of all outgoing interconnections, max. | 3,200 Byte |
| - Data length per connection, max. | 1,400 Byte |
| • Remote interconnections with cyclic transmission | |
| - Transmission frequency: transmission interval, min. | 1 ms |
| - Number of incoming interconnections | 300 |
| - Number of outgoing interconnections | 300 |
| - Data length of all incoming interconnections, max. | 4,800 Byte |
| - Data length of all outgoing interconnections, max. | 4,800 Byte |
| - Data length per connection, max. | 250 Byte |

## Technical specifications (continued)

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| • HMI variables via PROFINET (acyclic) | |
| - Number of log-in stations for HMI variables (PN OPC/iMap) | 3; 2x PN OPC/1x iMap |
| - HMI variable updating | 500 ms |
| - Number of HMI variables | 600 |
| - Data length of all HMI variables, max. | 9,600 Byte |
| • PROFIBUS proxy functionality | |
| - supported | Yes |
| - Number of linked PROFIBUS devices | 32 |
| - Data length per connection, max. | 240 Byte; Slave-dependent |
| **1st interface** | |
| Type of interface | Integral RS 485 interface |
| Physics | RS 485 |
| isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 150 mA |
| Functionality | |
| • MPI | Yes |
| • DP master | Yes |
| • DP slave | Yes |
| • Point-to-point coupling | No |
| MPI | |
| • Number of connections | 32 |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes |
| - Global data communication | Yes |
| - S7 basic communication | Yes |
| - S7 communication | Yes |
| - S7 communication, as client | No |
| - S7 communication, as server | Yes; possible via CP and loadable FB |
| • Transmission speeds, max. | 12 Mbit/s |
| DP master | |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes |
| - Global data communication | No |
| - S7 basic communication | Yes; with I blocks |
| - S7 communication | Yes |
| - S7 communication, as client | No |
| - S7 communication, as server | Yes |
| - Equidistance support | Yes |
| - Isochronous mode | No |
| - SYNC/FREEZE | Yes |
| - Activation/deactivation of DP slaves | Yes |
| - DPV1 | Yes |

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| • Transmission speeds, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 124 |
| • Address area | |
| - Inputs, max. | 8 KByte |
| - Outputs, max. | 8 KByte |
| • Useful data per DP slave | |
| - Inputs, max. | 244 Byte |
| - Outputs, max. | 244 Byte |
| DP slave | |
| • Services | |
| - Routing | Yes; with interface active |
| - Global data communication | No |
| - S7 basic communication | No |
| - S7 communication | Yes |
| - S7 communication, as client | No |
| - S7 communication, as server | Yes |
| - direct data exchange (cross traffic) | Yes |
| - DPV1 | No |
| • Transmission speeds, max. | 12 Mbit/s |
| • Transfer memory | |
| - Inputs | 244 Byte |
| - Outputs | 244 Byte |
| • Address area, max. | 32 |
| • Useful data per address area, max. | 32 Byte |
| **2nd interface** | |
| Type of interface | Integral RS 485 interface |
| Physics | RS 485 |
| isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| Functionality | |
| • MPI | No |
| • DP master | Yes |
| • DP slave | Yes |
| • PROFINET IO controller | No |
| • PROFINET CBA | No |
| • Point-to-point coupling | No |
| DP master | |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes |
| - Global data communication | No |
| - S7 basic communication | Yes; with I blocks |
| - S7 communication | Yes |
| - S7 communication, as client | No |
| - S7 communication, as server | Yes |
| - Equidistance support | Yes |
| - Isochronous mode | Yes; OB 61 |
| - SYNC/FREEZE | Yes |
| - DPV1 | Yes |

## Fail-safe CPU 319F-3 PN/DP



### Technical specifications (continued)

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| • Transmission speeds, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 124 |
| • Address area | |
| - Inputs, max. | 8 KByte |
| - Outputs, max. | 8 KByte |
| • Useful data per DP slave | |
| - Inputs, max. | 244 Byte |
| - Outputs, max. | 244 Byte |
| DP slave | |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes; with interface active |
| - Global data communication | No |
| - S7 basic communication | Yes |
| - S7 communication, as client | No |
| - S7 communication, as server | Yes |
| - direct data exchange (cross traffic) | Yes |
| - DPV1 | No |
| • GSD file | The current GSD file can be obtained from: http://www.siemens.com/profibus-gsd |
| • Transmission speeds, max. | 12 Mbit/s |
| • Automatic baud rate search | Yes; only with passive interface |
| • Transfer memory | |
| - Inputs | 244 Byte |
| - Outputs | 244 Byte |
| • Address area, max. | 32 |
| • Useful data per address area, max. | 32 Byte |
| **3rd interface** | |
| Type of interfaces | PROFINET |
| Physics | RJ45 |
| isolated | Yes |
| Automatic detection of transmission speed | Yes; (10/100 Mbit/s) |
| Functionality | |
| • MPI | No |
| • PROFINET IO controller | Yes |
| • PROFINET IO device | No |
| • PROFINET CBA | Yes |
| • Point-to-point coupling | No |

| | 6ES7 318-3FL00-0AB0 |
|---|---|
| Open IE communication | |
| • Number of connections, max. | 8 |
| PROFINET CBA (at 50 % communication load) | |
| • Acyclic transmission | Yes |
| • Cyclic transmission | Yes |
| **CPU/programming** | |
| Programming language | |
| • STEP 7 | Yes; 5.4 or higher, Service Pack 1 with HSP |
| • LAD | Yes |
| • FUP | Yes |
| • AWL | Yes |
| • SCL | Yes |
| • CFC | Yes |
| • GRAPH | Yes |
| • HiGraph | Yes |
| Software libraries | |
| Operational stocks | see instruction list |
| Nesting levels | 8 |
| User program protection/password protection | Yes |
| System functions (SFC) | see instruction list |
| System function blocks (SFB) | see instruction list |
| **Dimensions** | |
| Width | 120 mm |
| Height | 125 mm |
| Depth | 130 mm |
| **Weights** | |
| Weight, approx. | 1,250 g |

| Ordering data | | Order No. |
|---|---|---|
| **CPU 319F-3 PN/DP**<br>Main memory 1.4 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/slave interface, Ethernet/PROFINET interface;<br>MMC required | A) | **6ES7 318-3FL00-0AB0** |
| **Distributed Safety V5.4 programming tool**<br>*Task:*<br>Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S<br>*Requirement:*<br>STEP 7 V5.3 SP3 and higher | | |
| Floating license | | **6ES7 833-1FC02-0YA5** |
| Software Update Service | | **6ES7 833-1FC00-0YX2** |
| **Distributed Safety Upgrade**<br>From V5.x to V5.4; floating license for 1 user | | **6ES7 833-1FC02-0YE5** |
| **Micro Memory Card** | | |
| 64 KB | A) | **6ES7 953-8LF20-0AA0** |
| 128 KB | | **6ES7 953-8LG11-0AA0** |
| 512 KB | A) | **6ES7 953-8LJ20-0AA0** |
| 2 MB | A) | **6ES7 953-8LL20-0AA0** |
| 4 MB | A) | **6ES7 953-8LM20-0AA0** |
| 8 MB | A) | **6ES7 953-8LP20-0AA0** |
| **MPI cable**<br>For connecting SIMATIC S7 and the PG through MPI; 5 m in length | | **6ES7 901-0BF00-0AA0** |
| **Slot number plates** | | **6ES7 912-0AA00-0AA0** |
| **S7-300 manual**<br>Design, CPU data, module data, instruction list | | |
| German | | **6ES7 398-8FA10-8AA0** |
| English | | **6ES7 398-8FA10-8BA0** |
| French | | **6ES7 398-8FA10-8CA0** |
| Spanish | | **6ES7 398-8FA10-8DA0** |
| Italian | | **6ES7 398-8FA10-8EA0** |
| **SIMATIC Manual Collection**<br>Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (distributed I/O), SIMATIC PC, SIMATIC PG (programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors | D) | **6ES7 998-8XC01-8YE0** |
| **SIMATIC Manual Collection update service for 1 year**<br>Current "Manual Collection" DVD and the three subsequent updates | D) | **6ES7 998-8XC01-8YE2** |
| **Power supply connector**<br>10 units, spare part | | **6ES7 391-1AA00-0AA0** |
| **Labeling strips**<br>10 units, spare part | | **6ES7 392-2XX00-0AA0** |
| **Label cover**<br>10 units, spare part | | **6ES7 392-2XY00-0AA0** |
| **S7 SmartLabel**<br>Software for automatic labeling of modules based on data of the STEP 7 project | E) | **2XV9 450-1SL01-0YX0** |
| **Labeling sheets for machine inscription**<br>For 16-channel signal modules, DIN A4, for printing with laser printer;<br>10 units | | |
| petrol | | **6ES7 392-2AX00-0AA0** |
| light-beige | | **6ES7 392-2BX00-0AA0** |
| yellow | | **6ES7 392-2CX00-0AA0** |
| red | | **6ES7 392-2DX00-0AA0** |
| For 32-channel signal modules, DIN A4, for printing with laser printer;<br>10 units | | |
| petrol | | **6ES7 392-2AX10-0AA0** |
| light-beige | | **6ES7 392-2BX10-0AA0** |
| yellow | | **6ES7 392-2CX10-0AA0** |
| red | | **6ES7 392-2DX10-0AA0** |
| **Manual "Communication for SIMATIC S7-300/-400"** | | |
| German | | **6ES7 398-8EA00-8AA0** |
| English | | **6ES7 398-8EA00-8BA0** |
| French | | **6ES7 398-8EA00-8CA0** |
| Spanish | | **6ES7 398-8EA00-8DA0** |
| Italian | | **6ES7 398-8EA00-8EA0** |
| **SIMATIC S7 demo case**<br>With mounting components for mounting S7-200 and S7-300 | | **6ES7 910-3AA00-0XA0** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1
E) Subject to export regulations: AL: N and ECCN: EAR99S

## Fail-safe CPU 319F-3 PN/DP



### Ordering data (continued)

| | Order No. |
|---|---|
| ***PROFIBUS bus components*** | |
| **PROFIBUS DP bus connector RS 485** | |
| • With 90° cable outlet, max. transmission rate 12 Mbit/s | |
| - Without PG interface | **6ES7 972-0BA12-0XA0** |
| - With PG interface | **6ES7 972-0BB12-0XA0** |
| • With 90° cable outlet for FastConnect connection system, max. transmission rate 12 Mbit/s | |
| - Without PG interface | **6ES7 972-0BA50-0XA0** |
| - With PG interface | **6ES7 972-0BB50-0XA0** |
| • With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS | **6GK1 500-0EA02** |
| **PROFIBUS Fast Connect bus cable**<br>Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m | **6XV1 830-0EH10** |
| **RS 485 repeater for PROFIBUS**<br>Data transfer rate up to 12 Mbit/s; 24 V DC; IP 20 housing | **6ES7 972-0AA01-0XA0** |

| | Order No. |
|---|---|
| ***PROFINET bus components*** | |
| **IE FC TP standard cable GP 2x2**<br>4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval;<br>Sold by the meter | **6XV1 840-2AH10** |
| **FO Standard Cable GP (50/125)**<br>Standard cable, splittable, UL approval, sold by the meter | **6XV1 873-2A** |
| **SCALANCE X204-2 Industrial Ethernet switch**<br>Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports | **6GK5 204-2BB00-2AA3** |
| **IE FC RJ45 plugs**<br>RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables | |
| **IE FC RJ45 plug 145**<br>145° cable outlet | |
| 1 unit | **6GK1 901-1BB30-0AA0** |
| 10 units | **6GK1 901-1BB30-0AB0** |
| 50 units | **6GK1 901-1BB30-0AE0** |
| **IE FC RJ45 plug 180**<br>180° cable outlet | |
| 1 unit | **6GK1 901-1BB10-2AA0** |
| 10 units | **6GK1 901-1BB10-2AB0** |
| 50 units | **6GK1 901-1BB10-2AE0** |
| **PROFIBUS/PROFINET bus components**<br>For establishing MPI/PROFIBUS/PROFINET communication | See Catalogs IK PI, CA 01 |

## Overview SIPLUS 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.*

| | SIPLUS CPU 312C |
|---|---|
| **Order No.** | **6AG1 312-5BE03-2AB0** |
| **Order No. based on** | **6ES7 312-5BE03-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres). |
| Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1). | Yes |
| Technical data | The technical data are identical with the technical data of the based on modules. |

## Overview SIPLUS 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.*

| | SIPLUS CPU 313C |
|---|---|
| **Order No.** | **6AG1 313-5BF03-2AB0** |
| **Order No. based on** | **6ES7 313-5BF03-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres). |
| Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1). | Yes |
| Technical data | The technical data are identical with the technical data of the based on modules. |

For technical documentation to SIPLUS see:

http://www.siemens.com/siplus-techdoku

## SIPLUS compact CPUs



### Overview SIPLUS CPU 314C-2 DP

- The compact CPU with integrated digital and analog inputs and outputs and PROFIBUS DP master/slave interface
- With process-related functions
- For tasks with special functions
- For connection of distributed I/O

*Micro memory card required to operate the CPU.*

| | SIPLUS CPU 314C-2 DP |
|---|---|
| **Order No.** | **6AG1 314-6CG03-2AB0** |
| **Order No. based on** | **6ES7 314-6CG03-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial exposure (e.g. by chloric and sulphuric atmospheres). |
| Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1). | No |
| Technical data | The technical data are identical with the technical data of the based on modules. |

### Ordering data

| | | Order No. |
|---|---|---|
| **SIPLUS CPU 312C** | A) | **6AG1 312-5BE03-2AB0** |
| (extended temperature range and medial exposure)<br>Compact CPU, main memory 32 KB, power supply 24 V DC, 10 DI/6 DO integrated, integrated functions, MPI; including slot number labels; MMC is required | | |
| **SIPLUS CPU 313C** | A) | **6AG1 313-5BF03-2AB0** |
| (extended temperature range and medial exposure)<br>Compact CPU, main memory 64 KB, power supply 24 V DC, 24 DI/16 DO, 4 AI/2 AO integrated, integrated functions, MPI; MMC is required | | |
| **SIPLUS CPU 314C-2 DP** | A) | **6AG1 314-6CG03-2AB0** |
| (extended temperature range and medial exposure)<br>Compact CPU, main memory 96 KB, power supply 24 V DC, 24DI/16DO/4AI/2AO integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; MMC is required | | |
| **Accessories** | | see S7-300 Compact CPUs, catalog ST 70 · 2007, page 4/19 |

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

For technical documentation to SIPLUS see:

http://www.siemens.com/siplus-techdoku

## Overview SIPLUS CPU 314

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

*Micro memory card required to operate the CPU.*

| | SIPLUS CPU 314 |
|---|---|
| **Order No.** | **6AG1 314-1AG13-2AB0** |
| **Order No. based on** | **6ES7 314-1AG13-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial exposure (e.g. by chloric and sulphuric atmospheres). |
| Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1). | Yes |
| Technical data | The technical data are identical with the technical data of the based on modules. |

## Overview SIPLUS CPU 315-2 PN/DP

- The CPU with a medium program memory and quantity framework
- High processing performance in binary and floating-point arithmetic
- Used as a central controller on production lines with central and distributed I/O
- Integral PROFINET interface
- Combined MPI/PROFIBUS DP-master/slave interface
- 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

*Micro memory card required to operate the CPU.*

| | SIPLUS CPU 315-2 PN/DP |
|---|---|
| **Order No.** | **6AG1 315-2EH13-2AB0** |
| **Order No. based on** | **6ES7 315-2EH13-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial exposure (e.g. by chloric and sulphuric atmospheres). |
| Technical data | The technical data are identical with the technical data of the based on modules. |

For technical documentation to SIPLUS see:

http://www.siemens.com/siplus-techdoku

## SIPLUS standard CPUs



### Overview SIPLUS 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 to operate the CPU..*

| | SIPLUS CPU 317-2 PN/DP |
|---|---|
| **Order No.** | **6AG1 317-2EK13-2AB0** |
| **Order No. based on** | **6ES7 317-2EK13-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial exposure (e.g. by chloric and sulphuric atmospheres). |
| Technical data | The technical data are identical with the technical data of the based on modules. |

### Ordering data

| | Order No. |
|---|---|
| **SIPLUS CPU 314** A)<br>(extended temperature range and medial exposure)<br>Main memory 96 KB, power supply 24 V DC, MPI; MMC required | **6AG1 314-1AG13-2AB0** |
| **SIPLUS CPU 315-2 PN/DP** A)<br>(extended temperature range and medial exposure)<br>Main memory 256 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface, MMC required | **6AG1 315-2EH13-2AB0** |
| **SIPLUS CPU 317-2 PN/DP**<br>(extended temperature range and medial exposure)<br>Main memory 1024 KB power supply DC 24 V, combined MPI/PROFIBUS DP-Master/Slave-interface, Ethernet/PROFINET-interface; MMC required | **6AG1 317-2EK13-2AB0** |
| **Accessories** | see S7-300 standard CPUs, catalog ST 70 · 2007, page 4/41 |

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

For technical documentation to SIPLUS see:
http://www.siemens.com/siplus-techdoku

## Overview SIPLUS CPU 317F-2 DP

- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For design of a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the two integral PROFIBUS DP interfaces (PROFIsafe).
- Fail-safe I/O modules of the ET 200M range can also be centrally connected
- Central and distributed use of standard modules for non safety-relevant applications

*Micro memory card required to operate the CPU.*

| | SIPLUS CPU 317F-2 DP |
|---|---|
| **Order No.** | **6AG1 317-6FF03-2AB0** |
| **Order No. based on** | **6ES7 317-6FF03-0AB0** |
| Ambient temperature range | -25 °C to +60 °C, condensation permissible |
| Ambient conditions | Suitable for extraordinary medial exposure (e.g. by chloric and sulphuric atmospheres). |
| Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1). | Yes |
| Technical data | The technical data are identical with the technical data of the based on modules. |

## Ordering data

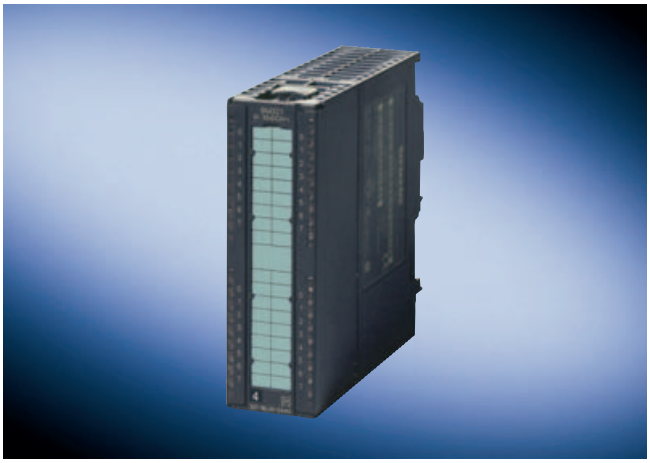
| | Order No. |
|---|---|
| **SIPLUS CPU 317F-2 DP** A)<br>(extended temperature range and medial exposure)<br>CPU for SIMATIC S7-300F; Main memory 1024 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required | **6AG1 317-6FF03-2AB0** |
| **Accessories** | see S7-300 fail-safe CPUs, catalog ST 70 · 2007, page 4/62 |

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

For technical documentation to SIPLUS see:
http://www.siemens.com/siplus-techdoku

## SM 321 digital input modules

### Overview



- Digital inputs
- For connecting standard switches and two-wire proximity switches (BERO)

### Technical specifications

| | 6ES7 321-1BP00-0AA0 |
|---|---|
| **Voltages and currents** | |
| Load voltage L+ | |
| • Rated value (DC) | 24 V |
| **Current consumption** | |
| from backplane bus 5 V DC, max. | 100 mA |
| Power loss, typ. | 7 W |
| **Connection point** | |
| required front connectors | Cable: 6ES7 392-4Bxx0-0AA0<br>Terminal blocks:<br>6ES7 392-1xN00-0AA0 |
| **Digital inputs** | |
| Number of digital inputs | 64 |
| Number of simultanneously controllable inputs | |
| • vertical installation | |
| - up to 40 °C, max. | 32 |
| • horizontal installation | |
| - up to 40 °C, max. | 64 |
| - up to 60 °C, max. | 32 |
| Input characteristic curve to IEC 1131, Typ 1 | Yes |
| Input voltage | |
| • Rated value, DC | 24 V |
| • for signal "0" | -30...5 V |
| • for signal "1" | 13...30 V |

| | 6ES7 321-1BP00-0AA0 |
|---|---|
| Input current | |
| • for signal "1", typ. | 4.2 mA; typical |
| Input delay (for rated value of input voltage) | |
| • for standard inputs | |
| - at "0" to "1", min. | 1.2 ms |
| - at "0" to "1", max. | 4.8 ms |
| **Status information/alarms/diagnostics** | |
| Diagnostics indication LED | |
| • Status indicator digital input (green) | Yes |
| **Isolation** | |
| Isolation checked with | 500 |
| **Isolation** | |
| Galvanic isolation, digital inputs | |
| • between the channels, in groups of | 16 |
| • between the channels and the backplane bus | Yes |
| **Dimensions** | |
| Width | 40 mm |
| Height | 125 mm |
| Depth | 112 mm |
| **Weights** | |
| Weight, approx. | 230 g; approx. |

## Ordering data

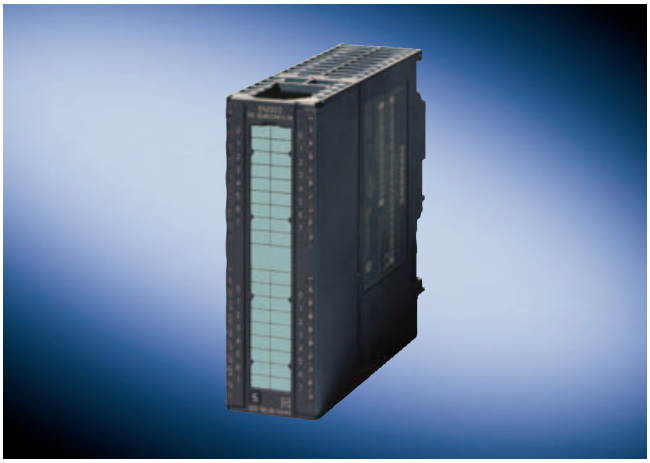
| | | Order No. |
|---|---|---|
| **SM 321 digital input modules** | | |
| incl. labeling strips, bus connector | | |
| 64 inputs, 24 V DC, active high/low | A) | **6ES7 321-1BP00-0AA0** |
| Note: Connecting cable 6ES7 392-4...0-0AA0 and terminal blocks 6ES7 392-1.N00-0AA0 required. | | |
| **S7-300 connecting cable** | | |
| For 64-channel modules; 2 units | | |
| 1 m | A) | **6ES7 392-4BB00-0AA0** |
| 2.5 m | A) | **6ES7 392-4BC50-0AA0** |
| 5 m | A) | **6ES7 392-4BF00-0AA0** |
| **Terminal block** | | |
| For 64-channel modules; 2 units | | |
| With screw contacts | A) | **6ES7 392-1AN00-0AA0** |
| With cage clamp contacts | A) | **6ES7 392-1BN00-0AA0** |
| **Bus connectors** | | **6ES7 390-0AA00-0AA0** |
| 1 unit (spare part) | | |

| | | Order No. |
|---|---|---|
| **SIMATIC Manual Collection** | D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors | | |
| **SIMATIC Manual Collection update service for 1 year** | D) | **6ES7 998-8XC01-8YE2** |
| Current S7 Manual Collection DVD and the three subsequent updates | | |
| **S7-300 manual** | | |
| Design, CPU data, module data, instruction list | | |
| German | | **6ES7 398-8FA10-8AA0** |
| English | | **6ES7 398-8FA10-8BA0** |
| French | | **6ES7 398-8FA10-8CA0** |
| Spanish | | **6ES7 398-8FA10-8DA0** |
| Italian | | **6ES7 398-8FA10-8EA0** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

## SM 322 digital output modules

### Overview



- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

### Technical specifications

| | 6ES7 322-1BP00-0AA0 | 6ES7 322-1BP50-0AA0 |
|---|---|---|
| **Voltages and currents** | | |
| Load voltage L+ | | |
| • Rated value (DC) | 24 V | 24 V |
| **Current consumption** | | |
| from load voltage L+ (without load), max. | 75 mA | 75 mA |
| from backplane bus 5 V DC, max. | 100 mA | 100 mA |
| Power loss, typ. | 6 W | 6 W |
| **Connection point** | | |
| required front connectors | Cable: 6ES7 392-4Bxx0-0AA0 Terminal blocks: 6ES7 392-1xN00-0AA0 | Cable: 6ES7 392-4Bxx0-0AA0; Terminal blocks: 6ES7 392-1xN00-0AA0 |
| **Digital outputs** | | |
| Number of digital outputs | 64 | 64 |
| Short-circuit protection of the output | Yes; electronic | Yes; electronic |
| Limitation of inductive shutdown voltage to | L+ (-53 V) | 45 |
| Lamp load, max. | 5 W | 5 W |
| Output voltage | | |
| • for signal "1", min. | L+ (-0.5 V) | M+ (0.5 V) |
| Output current | | |
| • for signal "1" rated value | 0.3 A | 0.3 A |
| • for signal "1" permissible range, min. | 2.4 mA | 2.4 mA |
| • for signal "1" permissible range, max. | 0.36 A | 0.36 A |
| • for signal "0" residual current, max. | 0.1 mA | |

| | 6ES7 322-1BP00-0AA0 | 6ES7 322-1BP50-0AA0 |
|---|---|---|
| Switching frequency | | |
| • with resistive load, max. | 100 Hz | 100 Hz |
| • with inductive load, max. | 0.5 Hz | 0.5 Hz |
| • on lamp load, max. | 10 Hz | 10 Hz |
| Aggregate current of the outputs (per group) | | |
| • vertical installation | | |
| - up to 40 °C, max. | | 1.6 A |
| • horizontal installation | | |
| - up to 40 °C, max. | 1.6 A | 1.6 A |
| - up to 60 °C, max. | 1.2 A | 1.2 A |
| **Status information/ alarms/diagnostics** | | |
| Diagnoses | | |
| • Diagnostics | No | No |
| **Isolation** | | |
| Isolation checked with | 500 V DC | 500 V DC |
| **Isolation** | | |
| Isolation, digital outputs | | |
| • between the channels, in groups of | 16 | 16 |
| • between the channels and the backplane bus | Yes; Optocoupler | Yes; Optocoupler |
| **Dimensions** | | |
| Width | 40 mm | 40 mm |
| Height | 125 mm | 125 mm |
| Depth | 112 mm | 112 mm |
| **Weights** | | |
| Weight, approx. | | |

| Ordering data | | Order No. |
|---|---|---|
| **SM 322 digital output modules** | | |
| incl. labeling strips, bus connector | | |
| 64 outputs, 24 V DC, 0.3 A | A) | **6ES7 322-1BP00-0AA0** |
| 64 outputs, 24 V DC, 0.3 A, sink output | A) | **6ES7 322-1BP50-0AA0** |
| Note:<br>Connecting cable 6ES7 392-4...0-0AA0 and Terminal blocks 6ES7 392-1.N00-0AA0 required. | | |
| **S7-300 connecting cable** | | |
| For 64-channel modules; 2 units | | |
| 1 m | A) | **6ES7 392-4BB00-0AA0** |
| 2.5 m | A) | **6ES7 392-4BC50-0AA0** |
| 5 m | A) | **6ES7 392-4BF00-0AA0** |
| **Terminal block** | | |
| For 64-channel modules; 2 units | | |
| With screw contacts | A) | **6ES7 392-1AN00-0AA0** |
| With cage clamp contacts | A) | **6ES7 392-1BN00-0AA0** |
| **Bus connectors** | | **6ES7 390-0AA00-0AA0** |
| 1 unit (spare part) | | |

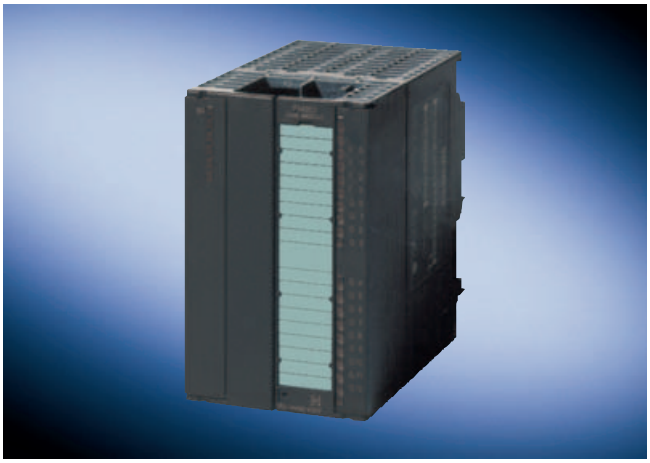
A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

| | | Order No. |
|---|---|---|
| **SIMATIC Manual Collection** | D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG (Programming device), STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors | | |
| **SIMATIC Manual Collection update service for 1 year** | D) | **6ES7 998-8XC01-8YE2** |
| Current S7 Manual Collection DVD and the three subsequent updates | | |
| **S7-300 manual** | | |
| Design, CPU data, module data, instruction list | | |
| German | | **6ES7 398-8FA10-8AA0** |
| English | | **6ES7 398-8FA10-8BA0** |
| French | | **6ES7 398-8FA10-8CA0** |
| Spanish | | **6ES7 398-8FA10-8DA0** |
| Italian | | **6ES7 398-8FA10-8EA0** |

# FM 352 cam controller



## Overview



- Extremely high-speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 13 onboard digital outputs for direct output of actions
- Incremental or synchro-serial position decoding

Note:

SIMODRIVE Sensor/Motion Connect 500 feature position-measuring systems and preassembled connecting cables for counting and positioning functions.

Additional information is available in the Internet under:

http://www.siemens.com/simatic-technology

## Technical specifications

| | 6ES7 352-1AH02-0AE0 |
|---|---|
| **Supply voltages** | |
| Rated value | |
| • 24 V DC | Yes |
| **Current consumption** | |
| from load voltage L+ (without load), max. | 200 mA |
| from backplane bus 5 V DC, max. | 100 mA |
| **Connection point** | |
| required front connectors | 1 x 20-pin |
| **Digital inputs** | |
| Number of digital inputs | 4 |
| Functions | Reference point switch, flying actual value setting/length measurement, brake release, enable track output no. 3 |
| Input voltage | |
| • Rated value, DC | 24 V |
| • for signal "0" | -30 to 5 V |
| • for signal "1" | 11 to 30 V |
| Input current | |
| • for 2-wire BERO | |
| - for signal "0", typ. | 2 mA |
| - for signal "1", typ. | 7 mA |
| **Digital outputs** | |
| Number of digital outputs | 13 |
| Functions | Cam track |
| Short-circuit protection of the output | Yes |
| Output voltage | |
| • Rated value (DC) | 24 V |
| • for signal "1", min. | UP - 0.8 V |
| Output current | |
| • for signal "1" permissible range for 0 to 60 °C, min. | 5 mA; with UPmax |
| • for signal "1" permissible range for 0 to 60 °C, max. | 600 mA; with UPmax |
| • for signal "0" residual current, max. | 0.5 mA |

| | 6ES7 352-1AH02-0AE0 |
|---|---|
| **Encoder supply** | |
| 5 V encoder supply | |
| • 5 V | Yes |
| • Output current, max. | 300 mA |
| • Cable length, max. | 32 m |
| 24 V encoder supply | |
| • 24 V | Yes |
| • Output current, max. | 300 mA |
| • Cable length, max. | 100 m |
| **Encoder** | |
| Connectable encoders | |
| • Incremental encoder (symmetrical) | Yes |
| • Incremental encoder (asymmetrical) | Yes |
| • Absolute encoder (SSI) | Yes |
| • 2-wire BEROS | Yes |
| • permissible quiescent current (2-wire BEROS), max. | 2 mA |
| Encoder signals, incremental encoder (symmetrical) | |
| • Trace mark signals | A, notA, B, notB |
| • Zero mark signal | N, notN |
| • Input signal | 5 V difference signal (phys. RS 422) |
| • Input frequency, max. | 1 MHz |
| Encoder signals, incremental encoder (asymmetrical) | |
| • Trace mark signals | A, B |
| • Zero mark signal | N |
| • Input voltage | 24 V |
| • Input frequency, max. | 50 kHz; 50 kHz for 25 m cable length, 25 kHz for 100 m cable length |
| Encoder signals, absolute encoder (SSI) | |
| • Data signal | DATA, notDATA |
| • Clock signal | CL, notCL |

## Technical specifications (continued)

| | 6ES7 352-1AH02-0AE0 |
|---|---|
| • Telegram length | 13 or 25 bit |
| • Clock frequency, max. | 1 MHz |
| • Gray code | yes |
| • Cable length, shielded, max. | 320 m; at max. 125 kHz |
| **Isolation** | |
| Galvanic isolation, digital inputs | |
| • Galvanic isolation, digital inputs | No |
| Isolation, digital outputs | |
| • Galvanic isolation, digital outputs | No |
| **Dimensions** | |
| Width | 80 mm |
| Height | 125 mm |
| Depth | 120 mm |
| **Weights** | |
| Weight, approx. | 550 g |

## Ordering data

| | | Order No. |
|---|---|---|
| **FM 352 electronic cam controller** | A) | **6ES7 352-1AH02-0AE0** |
| **Sub-D connector** | | **6ES5 750-2AA21** |
| 15-pin, male | | |
| **Front connector** | | |
| 20-pin, with screw contacts | | |
| • 1 unit | | **6ES7 392-1AJ00-0AA0** |
| • 100 units | | **6ES7 392-1AJ00-1AB0** |
| 20-pin, with spring-loaded contacts | | |
| • 1 unit | | **6ES7 392-1BJ00-0AA0** |
| • 100 units | | **6ES7 392-1BJ00-1AB0** |
| **Bus connectors** | | **6ES7 390-0AA00-0AA0** |
| 1 unit (spare part) | | |
| **Labeling strips** | | **6ES7 392-2XX00-0AA0** |
| 10 units (spare part) | | |
| **S7 SmartLabel** | E) | **2XV9 450-1SL01-0YX0** |
| Software for automatic labeling of modules based on data of the STEP 7 project | | |
| **Labeling sheets for machine inscription** | | see catalog ST 70 · 2007, page 4/240 |
| **Slot number label** | | **6ES7 912-0AA00-0AA0** |
| Spare part | | |
| **Shield connection element** | | **6ES7 390-5AA00-0AA0** |
| 80 mm wide, with 2 rows for 4 terminals each | | |

A) Subject to export regulations: AL: N and ECCN: EAR99H
E) Subject to export regulations: AL: N and ECCN: EAR99S

## Ordering data (continued)

| | Order No. |
|---|---|
| **Terminal elements** | |
| 2 units | |
| For 2 cables with 2 mm to 6 mm diameter | **6ES7 390-5AB00-0AA0** |
| For 1 cable with 3 mm to 8 mm diameter | **6ES7 390-5BA00-0AA0** |
| For 1 cable with 4 mm to 13 mm diameter | **6ES7 390-5CA00-0AA0** |
| **Signal cable** | |
| Pre-assembled for HTL encoder, UL/DESINA | **6FX5 0■2-2AL00-■■■■** |
| Pre-assembled for SSI absolute encoder, UL/DESINA | **6FX5 0■2-2CC11-■■■■** |
| Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA | **6FX5 0■2-2CD01-■■■■** |
| Pre-assembled for TTL encoder 24 V, UL/DESINA | **6FX5 0■2-2CD24-■■■■** |
| Not crimped | **0** |
| Module end crimped, connector case supplied | **1** |
| Motor end crimped, connector case supplied | **4** |
| 0 m | **1** |
| 100 m | **2** |
| 200 m | **3** |
| 0 m | **A** |
| 10 m | **B** |
| 20 m | **C** |
| 30 m | **D** |
| 40 m | **E** |
| 50 m | **F** |
| 60 m | **G** |
| 70 m | **H** |
| 80 m | **J** |
| 90 m | **K** |
| 0 m | **A** |
| 1 m | **B** |
| 2 m | **C** |
| 3 m | **D** |
| 4 m | **E** |
| 5 m | **F** |
| 6 m | **G** |
| 7 m | **H** |
| 8 m | **J** |
| 9 m | **K** |
| 0.0 m | **0** |
| 0.1 m | **1** |
| 0.2 m | **2** |
| 0.3 m | **3** |
| 0.4 m | **4** |
| 0.5 m | **5** |
| 0.6 m | **6** |
| 0.7 m | **7** |
| 0.8 m | **8** |

# SIWAREX U

## Overview

SIWAREX U weighing electronics

SIWAREX U is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in all SIMATIC automation systems. Complete data access is then possible via the SIMATIC.

## Technical specifications

| SIWAREX U | |
|---|---|
| **Integration in automation systems:** | |
| • S7-300 | Direct integration |
| • S7-400 (H) | Via ET 200M |
| • PCS 7 (H) | Via ET 200M |
| • C7 | Via IM or ET 200M |
| • Automation systems from other vendors | Via ET 200M |
| Stand-alone (without SIMATIC CPU) | Possible with IM 153-1 |
| **Communication interfaces** | • SIMATIC S7 (P bus)<br>• RS 232<br>• TTY |
| **Connection of remote displays** (through TTY serial interface) | Gross, channel 1, 2 or default value 1, 2 |
| **Adjustment of scales settings** | over SIMATIC (P bus) or PC using SIWATOOL U (RS 232) |
| **Measuring properties** | |
| • Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K | 0.05% |
| • Internal resolution ADC<br>Data format of weight values | 65535<br>2 byte (fixed-point) |
| **Number of measurements/second** | 50 |
| **Digital filter** | 0.05 - 5 Hz (in 7 steps), mean-value filter |
| **Weighing functions** | |
| • Weight values | Gross |
| • Limit values | 2 (min./max.) |
| • Zero setting function | Per command |
| **Load cells** | Strain gages in 4-wire or 6-wire system |

| SIWAREX U | |
|---|---|
| **Load cell powering** | |
| • Supply voltage $U_s$ (rated value) | 6 V DC[1] |
| • Max. supply current | ≤ 150 mA per channel |
| • Permissible load impedance | |
| - $R_{Lmin}$ | > 40 Ω per channel |
| - $R_{Lmax}$ | < 4010 Ω |
| | With Ex(i) interface: |
| - $R_{Lmin}$ | > 87 Ω per channel |
| - $R_{Lmax}$ | < 4010 Ω |
| **Permissible load cell characteristic** | Up to 4 mV/V |
| **Max. distance of load cells** | 500 m[2]<br>150/500 m for gas group IIC<br>500 m[2] for gas group IIB<br>(see SIWAREX IS Manual) |
| **Intrinsically-safe load cell powering** | Optional (Ex interface) with SIWAREX IS |
| **Supply voltage 24 V DC** | |
| • Rated voltage | 24 V DC |
| • Max. current consumption | 150 mA (single-channel) /<br>240 mA (two-channel) |
| **Voltage supply from backplane bus** | ≤ 100 mA |
| **Certification** | ATEX 95, FM, $cUL_{US}$ Haz. Loc. (all available soon) |
| **IP degree of protection to DIN EN 60529; IEC 60529** | IP20 |
| **Climatic requirements** | |
| $T_{min\ (IND)}$ to $T_{max\ (IND)}$) (operating temperature) | |
| • Vertical installation | 0 ... +60 °C |
| • Horizontal installation | 0 ... +40 °C |
| **EMC requirements according to** | NAMUR NE21, Part 1<br>EN 61326 |

1) Supply of load cells compared to 7MH4 601-1AA01 or ...1BA01 changed to 6 V DC.

2) Up to 1000 m possible under certain conditions, provided the recommended cable is used (see Accessories).

| Ordering data | | Order No. |
|---|---|---|
| **SIWAREX U**<br>for SIMATIC S7 and ET 200M, incl. bus connector, weight 0.3 kg | | |
| • Single-channel version[1]<br>for connecting one scale | A) | **7MH4 950-1AA01** |
| • Two-channel version[2]<br>for connecting two scales | A) | **7MH4 950-2AA01** |
| **SIWAREX U Manual** | | |
| • available in a range of languages<br>Free download on the Internet at: www.siemens.com/weighing-technology | | |
| **SIWAREX U configuration package[3] for SIMATIC S7 version 5.4 or higher**<br>on CD-ROM<br>• PC SIWATOOL U software (available in a range of languages), new design<br>• Sample program "Getting started" – ready to use application for SIMATIC S7<br>• SIWAREX U Manual on CD (in a range of languages), new design<br>• HSP Hardware Support Package for integrating SIWAREX U in STEP 7 | | **7MH4 950-1AK01** |
| **SIWAREX U configuration package for PCS 7, version 6.x**<br>in German and English on CD-ROM, module for the CFC and faceplate | | **7MH4 683-3BA64** |
| **SIWATOOL cable**<br>from SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), 3 m long | A) | **7MH4 607-8CA** |
| ***Installation material (mandatory)*** | | |
| **20-pin front plug with screw contacts**<br>(required for each SIWAREX module) | | **6ES7 392-1AJ00-0AA0** |
| **Shield contact element**<br>Sufficient for two SIWAREX U modules | | **6ES7 390-5AA00-0AA0** |
| **Shield connection terminal**<br>Contents: 2 units (suitable for cable with diameter 4 ... 13 mm)<br>Note:<br>one shield connection terminal each is required for:<br>• Scale connection<br>• RS 485 interface<br>• RS 232 interface | | **6ES7 390-5CA00-0AA0** |

| | Order No. |
|---|---|
| **S7 DIN rail** | |
| • 160 mm | **6ES7 390-1AB60-0AA0** |
| • 480 mm | **6ES7 390-1AE80-0AA0** |
| • 530 mm | **6ES7 390-1AF30-0AA0** |
| • 830 mm | **6ES7 390-1AJ30-0AA0** |
| • 2000 mm | **6ES7 390-1BC00-0AA0** |
| ***Accessories (optional)*** | |
| **PS 307 load power supplies**<br>(only required if 24 V DC not available)<br>120/230 V AC; 24 V DC, incl. power connector | |
| PS 307-1B; 2 A | **6ES7 307-1BA00-0AA0** |
| PS 307-1E; 5 A | **6ES7 307-1EA00-0AA0** |
| PS 307-1K; 10 A | **6ES7 307-1KA01-0AA0** |
| **Labeling strips**<br>(10 units, spare part) | **6ES7 392-2XX00-0AA0** |
| **Remote displays** (option)<br>The digital remote displays can be connected directly to SIWAREX U through a TTY interface.<br>The following remote displays can be used:<br>S102, S302<br>*Siebert Industrieelektronik GmbH*<br>*P.O. Box 1180*<br>*D-66565 Eppelborn*<br>*Tel.: 06806/980-0*<br>*Fax: 06806/980-999*<br>*Internet:* http://www.siebert.de<br>Detailed information available from manufacturer. | |
| **SIWAREX JB junction box, aluminium housing**<br>for connecting up to 4 load cells in parallel, and for connecting several junction boxes | **7MH4 710-1BA** |
| **SIWAREX JB junction box, stainless steel housing**<br>for connecting up to 4 load cells in parallel | **7MH4 710-1EA** |
| **Ex interface, type SIWAREX Pi**<br>With UL and FM approvals, but **without ATEX approval**<br>for intrinsically-safe connection of load cells,<br>suitable for the SIWAREX U, CS, MS, FTA, FTC and M weighing modules.<br>Not approved for use in the EU. | **7MH4 710-5AA** |
| **Manual for Ex interface type SIWAREX Pi** | **C71000-T5974-C29** |

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

1) compatible with 7MH4 601-1AA01; supply of load cells changed to 6 V DC.

2) compatible with 7MH4 601-1BA01; supply of load cells changed to 6 V DC.

3) replaces 7MH4 683-3AA63

## SIWAREX U

4

### Ordering data (continued)

| | Order No. |
|---|---|
| **SIWAREX IS Ex interface**<br>With ATEX approval, but **without UL and FM approvals**, for intrinsically-safe connection of load cells, including manual, suitable for the SIWAREX U, CS, MS, FTA, FTC, M and CF weighing modules. Approved for use in the EU. | |
| • With short-circuit current < 199 mA DC | **7MH4 710-5BA** |
| • With short-circuit current < 137 mA DC | **7MH4 710-5CA** |
| ***Cable (optional)*** | |
| **Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath**<br>to connect SIWAREX U, CS, MS, FTA, FTC, M and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C | **7MH4 702-8AG** |
| **Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath**<br>to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 to +80 °C | **7MH4 702-8AF** |
| **Cable LiYCY 4 x 2 x 0.25 mm²** A)<br>for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display | **7MH4 407-8BD0** |

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

## Overview

SIFLOW FC070 is based on the latest developments within the digital processing technology – engineered for high performance, fast flow step response, immunity against process generated noise, easy to install, commission and maintain.

SIFLOW FC070 is available in two versions:

- SIFLOW FC070 Standard
- SIFLOW FC070 Ex

The SIFLOW FC070 transmitter delivers true multi-parameter measurements, i.e. mass flow, volume flow, density, temperature and fraction.

SIFLOW FC070 is designed for integration in a variety of automation systems, i.e.

- Central mounted in S7-300, C7
- Decentralized in ET 200M for use with S7-300 and S7-400 as PROFIBUS DP masters
- Decentralized in ET 200M for use with any automation system using standardized PROFIBUS DP masters
- Stand-alone via a MODBUS RTU master, i.e. SIMATIC PDM

The SIFLOW FC070 transmitter can be connected to all sensors of types MASS 2100, MC2 and FC300.

## Technical specifications

| | SIFLOW FC070 |
|---|---|
| Measurement of | Mass flow, volume flow, density, sensor temperature, fraction A flow, fraction B flow, fraction A in % |
| Measurement functions | |
| • Totalizer 1 | Totalization of mass flow, volume flow, fraction A, fraction B |
| • Totalizer 2 | Totalization of mass flow, volume flow, fraction A, fraction B |
| • Single and 2-stage Batch function | Batching function with the use of one or two outputs for dosing in high and low speed |
| • 4 programmable limits | 4 programmable high/low limits for mass flow, volume flow density, sensor temperature, fraction A flow, fraction B flow, fraction A in %. Limits will generate an alarm if reached. |
| **Digital input** | |
| Functions | Start batch, stop batch, start/stop batch, hold/continue batch, reset totalizer 1, reset totalizer 2, reset totalizer 1 and 2, zero adjust, force frequency output, freeze frequency output |
| High signal | • Nominal voltage: 24 V DC<br>• Lower limit: 15 V DC<br>• Upper limit: 30 V DC<br>• Current: 2 ... 15 mA |
| Low signal | • Nominal voltage: 0 V DC<br>• Lower limit: -3 V DC<br>• Upper limit: 5 V DC<br>• Current: -15 ... 15 mA |
| Input | Approx. 10 KΩ |
| Switching | Max. 100 Hz |

| | SIFLOW FC070 |
|---|---|
| **Digital output 1 and 2** | |
| Functions | • Output 1:<br>Pulse, frequency, quadrature pulse, quadrature frequency 2-stage batch, batch<br>• Output 2:<br>Quadrature pulse, quadrature frequency, 2-stage batch |
| Voltage supply | 3 ... 30 V DC (passive output) |
| Switching current | Max. 30 mA at 30 V DC |
| Voltage drop | ≤ 3 V DC at max. current |
| Leakage current | ≤ 0.4 mA at max. voltage 30 V DC |
| Load resistance | 1 KΩ to 10 KΩ |
| Switching frequency | 0 ... 12 KHz 50% duty cycle |
| Functions | Pulse, frequency, quadrature pulse, quadrature frequency 2-stage batch, batch |
| **Communication** | |
| MODBUS RS 232C | • Max. baudrate: 115.200 baud<br>• Max. line length: 15 m at 115.200 baud<br>• Signal level: according to EIA-RS 232C |
| MODBUS RS 485 | • Max. baudrate: 115.200 baud<br>• Max. line length:<br>1200 m at 115.200 baud<br>• Signal level: according to EIA-RS 485<br>• Bus termination: Integrated. Can be enabled by inserting wire jumpers. |
| **Galvanic isolation** | All inputs, outputs and communication interfaces are galvanically isolated. Isolation voltage: 500 V |

## SIFLOW FC070

### Technical specifications (continued)

| | SIFLOW FC070 |
|---|---|
| **Power** | |
| Supply | 24 V DC nominal |
| Tolerance | 20.4 V DC ... 28.8 V DC |
| Consumption | Max. 6 W |
| Fuse | T1A / 125 V, not to be changed by user |
| **Environment** | |
| Ambient temperature | • Storage -40 °C ... +70 °C (-40 ... +158 °F)<br>• Operation 0 °C ... +60 °C (32 ... 140 °F) |
| Operation conditions | Horizontally mounted rail. For vertically mounted rail, the maximum operating temperature is +45°C (+113 °F). |
| Altitude | • Operation: -1000 m ... 2000 m (pressure 795 hPa ... 1080 hPa) |
| **Enclosure** | |
| Material | Noryl, color: athracite |
| Rating | IP20/NEMA 2 according to IEC 60529 |
| Mechanical load | According to SIMATIC standards (S7-300 devices) |

| | SIFLOW FC070 |
|---|---|
| **Approvals** | |
| • SIFLOW FC070 Standard | CE, cULus, ATEX II 3G EEx nA IIC |
| • SIFLOW FC070 Ex | CE, cULus, UL Haz.Loc., FM, ATEX II 3 G EEx nA II T4 and II (1) G [EEx ia] IIC |
| **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>Emitted interference according to EN 50081-2, tested according to EN 55011, class A, group 1 |
| **NAMUR** | Within the limits according to "Allgemeine Anforderung" with error criteria A in accordance with NE21 |
| **Programming tools** | |
| SIMATIC S7 | Configuration trough backplane P-BUS and PLC program |
| SIMATIC PCS7 | Configuration trough backplane P-BUS and PLC/WinCC faceplates |
| SIMATIC PDM | Through MODBUS port RS 232C and RS 485 |

### Ordering data

| | | Order No. |
|---|---|---|
| **SIFLOW FC070 flow transmitter**<br>Remember to order 40 pin front plug connector. | L) | **7ME4 120-2DH20-0EA0** |
| **40 pin front plug with screw contacts** | | **6ES7 392-1AM00-0AA0** |
| **SIFLOW FC070 Ex flow transmitter**<br>Remember to order 20 pin front plug connector. | | **7ME4 120-2DH21-0EA0** |
| **20 pin front plug with screw contacts** | | **6ES7 392-1AJ00-0AA0** |
| ***Accessories*** | | |
| **Description**<br>Cable with multiplug for connecting MASS2100 and FC300 sensors | | |
| 5 m (16.4 ft) | L) | **FDK-083H3015** |
| 10 m (32.8 ft) | L) | **FDK-083H3016** |
| 25 m (82 ft) | L) | **FDK-083H3017** |
| 50 m (164 ft) | L) | **FDK-083H3018** |
| 75 m (246 ft) | L) | **FDK-083H3054** |
| 150 m (492 ft) | L) | **FDK-083H3055** |

| | | Order No. |
|---|---|---|
| **Cable without multiplug for connecting MC2 sensors** | | |
| 5 m (16.4 ft) | L) | **FDK-083H3001** |
| 25 m (82 ft) | L) | **FDK-083H3002** |
| 75 m (246 ft) | L) | **FDK-083H3003** |
| 150 m (492 ft) | L) | **FDK-083H3004** |
| **SIMATIC S7-300 rail**<br>**The mechanical mounting rack of the SIMATIC S7-300** | | |
| 160 mm (6.3") | | **6ES7 390-1AB60-0AA0** |
| 482 mm (18.9") | | **6ES7 390-1AE80-0AA0** |
| 530 mm (20.8") | | **6ES7 390-1AF30-0AA0** |
| 830 mm (32.7") | | **6ES7 390-1AJ30-0AA0** |
| 2000 mm (78.7") | | **6ES7 390-1BC00-0AA0** |
| **Shield connecting element**<br>For mounting on S7-300 rail. 80 mm wide with 2 rows for 4 shield terminal elements each (no shield terminal elements included) | | **6ES7 390-5AA00-0AA0** |
| **Shield terminal element** | | |
| for 1 cable with 3 to 8 mm in dia. 2 pieces | | **6ES7 390-5BA00-0AA0** |
| for 1 cable with 4 to 13 mm in dia. 2 pieces | | **6ES7 390-5CA00-0AA0** |

L) Subject to export regulations: AL: 9I999 and ECCN: N

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## Overview

| PN | ISO | TCP/IP | UDP | PG | S7 | S5 | IT | FTP |
|---|---|---|---|---|---|---|---|---|
| ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |

- Connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - 2 x RJ45 interface for 10/100 Mbit/s full/half duplex connection with autosensing/autonegotiation and autocrossover function
  - Integral 2-port real-time switch ERTEC
  - Multi-protocol operation with ISO, TCP and UDP transport protocol and PROFINET I/O
  - Adjustable Keep Alive function
- Communication services:
  - Open IE communication (ISO, TCP/IP and UDP)
  - PROFINET IO Controller or PROFINET IO Device
  - Programming device/operator panel communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing)
  - S5-compatible communication
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection by means of configurable access list
- Remote programming and initial startup via Industrial Ethernet
- Automatic setting of the CPU clock via Ethernet with NTP or SIMATIC procedure
- Integration in network management systems over SNMP (MIB2 diagnostic information)
- Diagnostic possibilities in STEP 7 and with web browser

## Technical specifications

| | CP 343-1 |
|---|---|
| Data transmission rate | 10/100 Mbit/s autosensing |
| Interfaces | |
| • Communication connection, electrical | 2 x RJ45 (10/100 Mbit/s; TP) Autonegotiation/autocrossover function |
| • Connection for supply voltage | 1 x 2-pin plug-in terminal block |
| Supply voltage | +24 V DC |
| • Permissible range | +20.4 … +28.8 V |
| Current consumption | |
| • from the backplane bus | 200 mA |
| • from 24 V DC external | max. 200 mA |
| Power loss | 5.8 W |
| Permissible ambient conditions | |
| • Operating temperature | 0 °C … +60 °C |
| • Transport/storage temperature | -40 °C … +70 °C |
| • Relative humidity | max. 95% at +25 °C |
| Design | |
| • Module format | Compact module S7-300, single width |
| • Dimensions (W x H x D) in mm | 40 x 125 x 120 |
| • Weight | approx. 220 g |
| Configuring software | NCM S7 for Industrial Ethernet (included in the scope of delivery of STEP 7 V5.x). |

| | CP 343-1 |
|---|---|
| **Performance data** | |
| **Open IE/S5-compatible communication** (SEND/RECEIVE) | |
| • Sum of all simultaneously operable TCP/UDP connections | max. 16 |
| • Useful data | |
| - TCP | 8192 byte |
| - UDP | 2048 byte |
| **S7 communication** | |
| • Number of connections | max. 16 |
| **PG/OP communication** | |
| • Number of operable OP connections (acyclic services) | max. 16 |
| Multi-protocol operation | |
| • Sum of all simultaneously operable connections | max. 32 |
| Multicast | 16 |
| **PROFINET communication** | |
| PROFINET IO Controller | |
| • Number of operable PN IO-Devices | 32 |
| • Size of IO data areas overall | |
| - I/O input area | 1024 Byte |
| - I/O output area | 1024 Byte |

## Technical specifications (continued)

| | CP 343-1 |
|---|---|
| • Size of I/O data areas per connected PN IO device | |
| - I/O input area | max. 240 byte |
| - I/O output range | max. 240 byte |
| • Size of I/O data areas per submodule in PN IO device | |
| - I/O input area | max. 240 byte |
| - I/O output range | max. 240 byte |

| | CP 343-1 |
|---|---|
| PROFINET IO Device | |
| • Size of IO data ranges overall | |
| - I/O input range | 512 byte |
| - I/O output range | 512 byte |
| • Size of I/O data areas per submodule in PN IO device | |
| - I/O input range | max. 240 byte |
| - I/O output range | max. 240 byte |
| • Size of consistent range for a submodule | max. 240 byte |
| • Number of submodules in PN IO Device | max. 32 |

## Ordering data

| | Order No. |
|---|---|
| **CP 343-1 communications processor** H)<br>For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO Controller or PROFINET IO Device, integrated 2-port switch ERTEC; S7 communication, S5-compatible communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbit/s; with electronic manual on DVD | **6GK7 343-1EX30-0XE0** |
| **IE FC TP Standard Cable GP 2x2**<br>4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter | **6XV1 840-2AH10** |
| **FO Standard Cable GP (50/125)**<br>Standard cable, splittable, UL approval, sold by the meter | **6XV1 873-2A** |
| **SCALANCE X204-2 Industrial Ethernet switch**<br>Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports | **6GK5 204-2BB00-2AA3** |

| | Order No. |
|---|---|
| **IE FC RJ45 Plug 145**<br>RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 145° cable outlet | |
| • 1 pack = 1 unit | **6GK1 901-1BB30-0AA0** |
| • 1 pack = 10 units | **6GK1 901-1BB30-0AB0** |
| • 1 pack = 50 units | **6GK1 901-1BB30-0AE0** |
| **SOFTNET-S7 Edition 2006 for Industrial Ethernet**<br>Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 64 connections, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1CW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: Current software version | **6GK1 704-1CW00-3AL0** |
| • Upgrade from V6.0 and higher to Edition 2006 | **6GK1 704-1CW64-3AE0** |

H) Subject to export regulations: AL: N and ECCN: 5A991

## Ordering data (continued)

| | Order No. |
|---|---|
| **SOFTNET-S7 Lean Edition 2006 for Industrial Ethernet** | |
| Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 8 connections, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1LW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1LW00-3AL0** |
| • Upgrade from V6.0 and higher to Edition 2006 | **6GK1 704-1LW64-3AE0** |
| **S7-1613 Edition 2006** | **6GK1 716-1CB64-3AA0** |
| Software for S7 and S5 communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, Windows 2000 Professional/Server; for CP 1613/CP 1613 A2 German/English | |

| | Order No. |
|---|---|
| **NCM S7 configuration software V5.4 SP1 for Industrial Ethernet** | |
| For execution under STEP 7 V5.4 SP1; additional Hardware Support Package (HSP)[1]; documentation on CD-ROM, with electronic manual in English, German, French, Spanish and Italian | Included in the STEP 7 V5 package |
| **Documentation S7-CPs/NCM for Industrial Ethernet and PROFIBUS** | |
| for V5.x (STEP 7 V5.x); paper version | |
| • German | **6GK7 080-0AA01-8AA0** |
| • English | **6GK7 080-0AA01-8BA0** |

1) The HSP for the CP 343-1 (EX30) can be directly downloaded and installed from the Internet using STEP 7, and is already included in STEP 7 V5.4 SP2 and higher.

# SIMATIC S7-400

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***Brochures***

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

# CPU 412

## Overview

- The low-cost starter solution for the medium performance range
- Can be used in small and medium-sized systems with requirements of the medium performance range

## Technical specifications

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| **Product status** | | |
| Hardware product status | 1 | |
| Firmware version | V5.0 | V5.0 |
| Associated programming package | STEP7 V5.3 SP2 or higher with HW update | STEP7 V5.3 SP2 or higher with HW update |
| **Voltages and currents** | | |
| Feeding of external buffer voltage to CPU | 5 to 15 V DC | 5 to 15 V DC |
| **Current consumption** | | |
| from backplane bus 5 V DC, max. | 0.6 A | 1.1 A |
| from interface 5 V DC, max. | 90 mA; at the DP interface | 90 mA; at each DP interface |
| Power loss, typ. | 2.5 W | 4 W |
| **Backup battery** | | |
| • Buffer current, typ. | 125 µA; (up to 40 °C) | 125 µA; Valid up to 40°C |
| • Buffer current, max. | 550 µA | 550 µA; Dealt with in the module data manual with the secondary conditions and the factors of influence |
| **Memory** | | |
| Type of storage | | |
| • RAM | | |
| - integrated (for program) | 144 KByte | 256 KByte |
| - integrated (for data) | 144 KByte | 256 KByte |
| - expandable | No | No |
| • Load memory | | |
| - expandable FEPROM | Yes | Yes |
| - expandable FEPROM, max. | 64 MByte | 64 MByte |
| - integrated RAM, max. | 512 KByte | 512 KByte |
| - expandable RAM | Yes | Yes |
| - expandable RAM, max. | 64 MByte | 64 MByte |

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| Backup | | |
| • present | Yes | Yes |
| • with battery | Yes | Yes |
| • without battery | No | No |
| **CPU/blocks** | | |
| DB | | |
| • Number, max. | 1,500; Number range: 1 to 16,000 | 3,000; Number range: 1 to 16,000 |
| • Size, max. | 64 KByte | 64 KByte |
| FB | | |
| • Number, max. | 750; Number range: 0 to 7,999 | 1,500; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte | 64 KByte |
| FC | | |
| • Number, max. | 750; Number range: 0 to 7,999 | 1,500; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte | 64 KByte |
| OB | | |
| • Size, max. | 64 KByte | 64 KByte |
| Nesting depth | | |
| • per priority class | 24 | 24 |
| • additional within an error OB | 1 | 1 |
| **CPU/processing times** | | |
| for bit operations, min. | 75 ns | 75 ns |
| for word operations, min. | 75 ns | 75 ns |
| for fixed point arithmetic, min. | 75 ns | 75 ns |
| for floating point arithmetic, min. | 225 ns | 225 ns |

## Technical specifications (continued)

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| **Times/counters and their remanence** | | |
| S7 counter | | |
| • Number | 2.048 | 2.048 |
| • Remanence | | |
| - adjustable | Yes | Yes |
| - lower limit | 0 | 0 |
| - upper limit | 2,047 | 2,047 |
| - preset | Z 0 to Z 7 | Z 0 to Z 7 |
| • Counting range | | |
| - lower limit | 0 | 0 |
| - upper limit | 999 | 999 |
| IEC counter | | |
| • present | Yes | Yes |
| • Type | SFB | SFB |
| S7 times | | |
| • Number | 2,048 | 2,048 |
| • Remanence | | |
| - adjustable | Yes | Yes |
| - lower limit | 0 | 0 |
| - upper limit | 2,047 | 2,047 |
| - preset | | No timers retentive |
| • Time range | | |
| - lower limit | 10 ms | 10 ms |
| - upper limit | 9,990 s | 9,990 s |
| IEC timer | | |
| • present | Yes | Yes |
| • Type | SFB | SFB |
| **Data areas and their remanence** | | |
| remanent data area, total | Total working and load memory | Total working and load memory (with backup battery) |
| Flag | | |
| • Number, max. | 4 KByte | 4 KByte |
| • Remanence available | Yes | Yes |
| • Number of clock memories | 8; (in 1 memory byte) | 8; (in 1 memory byte) |
| **Address area** | | |
| I/O address area | | |
| • Inputs | 4 KByte | 4 KByte |
| • Outputs | 4 KByte | 4 KByte |
| • of which, distributed | | |
| - MPI/DP interface, inputs | 2 KByte | 2 KByte |
| - MPI/DP interface, outputs | 2 KByte | 2 KByte |
| - DP interface, inputs | | 4 KByte |
| - DP interface, outputs | | 4 KByte |

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| Process image | | |
| • Inputs, adjustable | 4 KByte | 4 KByte |
| • Outputs, adjustable | 4 KByte | 4 KByte |
| • Inputs, preset | 128 Byte | 128 Byte |
| • Outputs, preset | 128 Byte | 128 Byte |
| • consistent data, max. | 244 Byte | 244 Byte |
| • Access to consistent data in process image | Yes | Yes |
| Subprocess images | | |
| • Number of subprocess images, max. | 15 | 15 |
| Digital channels | | |
| • Inputs | 32.768 | 32.768 |
| • Outputs | 32.768 | 32.768 |
| • Inputs, of which central | 32.768 | 32.768 |
| • Outputs, of which central | 32.768 | 32.768 |
| Analog channels | | |
| • Inputs | 2.048 | 2.048 |
| • Outputs | 2.048 | 2.048 |
| • Inputs, of which central | 2.048 | 2.048 |
| • Outputs, of which central | 2.048 | 2.048 |
| **Hardware configuration** | | |
| connectable OPs | 31 | 31 |
| Central devices, max. | 1 | 1 |
| Expansion devices, max. | 21 | 21 |
| Multicomputing | Yes; Max. 4 CPUs (with UR1 or UR2) | Yes; Max. 4 CPUs (with UR1 or UR2) |
| IM | | |
| • Number of connectable IMs (total), max. | 6 | 6 |
| • Number of connectable IM 460s, max. | 6 | 6 |
| • Number of connectable IM 463s, max. | 4; IM 463-2 | 4; IM 463-2 |
| Number of DP masters | | |
| • integrated | 1 | 2 |
| • via IM 467 | 4 | 4 |
| • via CP | 10; CP 443-5 Extended | 10; CP 443-5 Extended |
| • Mixed mode IM + CP permitted | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1EX40 in PN IO mode | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1EX40 in PN IO mode |
| • via interface module | 0 | 0 |
| • Number of pluggable S5 modules (via adapter capsule in central device), max. | 6 | 6 |

## Technical specifications (continued)

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| Number of IO controllers | | |
| • integrated | 0 | |
| • via CP | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller | Via CP 443-1 EX 41 in PN mode; max. 4 in central controller |
| Number of operable FMs and CPs (recommended) | | |
| • FM | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • CP, point-to-point | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • PROFIBUS and Ethernet CPs | 14; Of which 10 CPs max. or IMs as DP master, 4 PN controller maximum | 14; Of which 10 CP or IM max. as DP master and PN controller |
| **Time** | | |
| Clock | | |
| • Hardware clock (real-time clock) | Yes | Yes |
| • buffered and synchronizable | Yes | Yes |
| • Resolution | 1 ms | 1 ms |
| Operating hours counter | | |
| • Number | 8 | 8 |
| Clock synchronization | | |
| • supports | Yes | Yes |
| • to MPI, Master | Yes | Yes |
| • to MPI, Slave | Yes | Yes |
| • to DP, Master | Yes | Yes |
| • to DP, Slave | Yes | Yes |
| • in AS, Master | Yes | Yes |
| • in AS, Slave | Yes | Yes |
| • on Ethernet via NTP | No; Via CP | Via CP |
| **S7 message functions** | | |
| Number of login stations for message functions, max. | 31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 | 31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC) |
| Symbol-related messages | Yes | Yes |
| Number of messages | | |
| • overall, max. | 512 | 512 |
| Block related messages | Yes | Yes |
| Alarm 8-blocks | Yes | Yes |
| Instrumentation & control messages | Yes | Yes |

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| **Test commissioning functions** | | |
| Status/control | | |
| • Status/control variable | Yes | Yes |
| Forcing | | |
| • Forcing | Yes | Yes |
| Status block | Yes | Yes |
| Single step | Yes | Yes |
| Number of breakpoints | 4 | 4 |
| Diagnostic buffer | | |
| • present | Yes | Yes |
| • Number of entries, max. | 200 | 400 |
| • adjustable | Yes | Yes |
| • preset | 120 | 120 |
| **Communication functions** | | |
| PG/OP communication | Yes | Yes |
| Routing | Yes | Yes |
| Global data communication | | |
| • supported | Yes | Yes |
| • Size of GD packets, max. | 54 Byte | 54 Byte |
| S7 basic communication | | |
| • supported | Yes | Yes |
| • Useful data per job, max. | 76 Byte | 76 Byte |
| S7 communication | | |
| • supported | Yes | Yes |
| • Useful data per job, max. | 64 KByte | 64 KByte |
| S5-compatible communication | | |
| • supported | Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5 | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) |
| • Useful data per job, max. | 8 KByte | 8 KByte |
| Standard communication (FMS) | | |
| • supported | Yes; Via CP and loadable FB | Yes; Via CP and loadable FB |
| Web server | No; Via CP | No; Via CP |
| Open IE communication | | |
| • ISO-on-TCP (RFC1006) | Via CP 443-1 Adv. and loadable FB | Via CP 443-1 Adv. and loadable FB |
| - Number of connections, max. | 30 | |
| - Data length, max. | 1,452 Byte | 1,452 Byte |
| Number of connections | | |
| • overall | 32 | 32 |

## Technical specifications (continued)

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| **1st interface** | | |
| Physics | RS 485 / PROFIBUS | RS 485 / PROFIBUS |
| isolated | Yes | Yes |
| Functionality | | |
| • MPI | Yes | Yes |
| • DP master | Yes | Yes |
| • DP slave | Yes | Yes |
| MPI | | |
| • Number of connections | 32 | 32 |
| • Services | | |
| - PG/OP communication | Yes | Yes |
| - Routing | Yes | Yes |
| - Global data communication | Yes | Yes |
| - S7 basic communication | Yes | Yes |
| - S7 communication | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s |
| DP master | | |
| • Number of connections, max. | 16 | 16 |
| • Services | | |
| - PG/OP communication | Yes | Yes |
| - Routing | Yes | Yes |
| - S7 basic communication | Yes | Yes |
| - S7 communication | Yes | Yes |
| - Equidistance support | Yes | Yes |
| - Activation/deactivation of DP slaves | Yes | Yes |
| - direct data exchange (cross traffic) | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s |
| • Number of DP slaves, max. | 32; Max. 544 slots | 32 |
| • Address area | | |
| - Inputs, max. | 2 KByte | 2 KByte |
| - Outputs, max. | 2 KByte | 2 KByte |
| • Useful data per DP slave | 244 Byte | 244 Byte |
| - Inputs, max. | 244 Byte | 244 Byte |
| - Outputs | 244 Byte | 244 Byte |
| DP slave | | |
| • Number of connections | 16 | 16 |
| • Services | | |
| - Routing | Yes | Yes |
| - Status/control | Yes | Yes |
| - Programming | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s |
| • Transfer memory | | |
| - Inputs | 244 Byte | 244 Byte |
| - Outputs | 244 Byte | 244 Byte |
| • Address area, max. | 32; Virtual slots | 32 |
| • Useful data per address area, max. | 32 Byte | 32 Byte |
| • Useful data per address area, of which consistent, max. | 32 Byte | 32 Byte |
| **2nd interface** | | |
| Physics | | RS 485 / PROFIBUS |
| isolated | | Yes |
| Functionality | | |
| • DP master | | Yes |
| • DP slave | | Yes |
| DP master | | |
| • Number of connections, max. | | 16 |
| • Services | | |
| - PG/OP communication | | Yes |
| - Routing | | Yes |
| - S7 basic communication | | Yes |
| - S7 communication | | Yes |
| - Equidistance support | | Yes |
| - Activation/deactivation of DP slaves | | Yes |
| - direct data exchange (cross traffic) | | Yes |
| • Transmission speeds, max. | | 12 Mbit/s |
| • Number of DP slaves, max. | | 64 |
| • Address area | | |
| - Inputs, max. | | 4 KByte |
| - Outputs, max. | | 4 KByte |
| • Useful data per DP slave | | |
| - Inputs, max. | | 244 Byte |
| - Outputs, max. | | 244 Byte |
| DP slave | | |
| • Number of connections | | 16 |
| • Services | | |
| - Routing | | Yes |
| - Status/control | | Yes |
| - Programming | | Yes |
| • Transmission speeds, max. | | 12 Mbit/s |
| • Transfer memory | | |
| - Inputs | | 244 Byte |
| - Outputs | | 244 Byte |
| • Address area, max. | | 32 |
| • Useful data per address area, max. | | 32 Byte |
| • Useful data per address area, of which consistent, max. | | 32 Byte |

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## Technical specifications (continued)

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| **Isochronous mode** | | |
| Useful data per isochronous slave, max. | 244 Byte | 244 Byte |
| Equidistance | Yes | Yes |
| shortest clock pulse | 1.5 ms; 0.5 ms without use of SFC 126, 127 | 1.5 ms; 0.5 ms without use of SFC 126, 127 |
| **CiR configuration in RUN** | | |
| CiR synchronization time, basic load | 100 ms | 100 ms |
| CiR synchronization time, time per I/O slave | 200 µs | 200 µs |
| **CPU/programming** | | |
| Configuration software | | |
| • STEP 7 | Yes | Yes |

| | 6ES7 412-1XJ05-0AB0 | 6ES7 412-2XJ05-0AB0 |
|---|---|---|
| Programming language | | |
| • LAD | Yes | Yes |
| • FUP | Yes | Yes |
| • AWL | Yes | Yes |
| • SCL | Yes | Yes |
| • CFC | Yes | Yes |
| • GRAPH | Yes | Yes |
| • HiGraph | Yes | Yes |
| Nesting levels | 7 | 7 |
| User program protection/password protection | Yes | Yes |
| **Dimensions** | | |
| Width | 25 mm | 25 mm |
| Height | 290 mm | 290 mm |
| Depth | 219 mm | 219 mm |
| **Dimensions** | | |
| Required slots | 1 | 1 |
| **Weights** | | |
| Weight, approx. | 720 g | 720 g |

| Ordering data | | Order No. |
|---|---|---|
| **CPU 412-1** | A) | **6ES7 412-1XJ05-0AB0** |
| Main memory 288 KB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels | | |
| **CPU 412-2** | A) | **6ES7 412-2XJ05-0AB0** |
| Main memory 512 KB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels | | |
| **Memory Card RAM** | | |
| 64 KB | | **6ES7 952-0AF00-0AA0** |
| 256 KB | | **6ES7 952-1AH00-0AA0** |
| 1 MB | | **6ES7 952-1AK00-0AA0** |
| 2 MB | | **6ES7 952-1AL00-0AA0** |
| 4 MB | | **6ES7 952-1AM00-0AA0** |
| 8 MB | | **6ES7 952-1AP00-0AA0** |
| 16 MB | | **6ES7 952-1AS00-0AA0** |
| 64 MB | | **6ES7 952-1AY00-0AA0** |
| **FEPROM memory card** | | |
| 64 KB | | **6ES7 952-0KF00-0AA0** |
| 256 KB | | **6ES7 952-0KH00-0AA0** |
| 1 MB | | **6ES7 952-1KK00-0AA0** |
| 2 MB | | **6ES7 952-1KL00-0AA0** |
| 4 MB | | **6ES7 952-1KM00-0AA0** |
| 8 MB | | **6ES7 952-1KP00-0AA0** |
| 16 MB | | **6ES7 952-1KS00-0AA0** |
| 32 MB | | **6ES7 952-1KT00-0AA0** |
| 64 MB | | **6ES7 952-1KY00-0AA0** |
| **MPI cable** | | **6ES7 901-0BF00-0AA0** |
| For connecting SIMATIC S7 and the PG through MPI; 5 m in length | | |
| **Slot number plates** | | **6ES7 912-0AA00-0AA0** |
| 1 set (spare part) | | |
| **Manual "SIMATIC S7-400 programmable controller"** | | |
| incl. instruction list | | |
| German | | **6ES7 498-8AA05-8AA0** |
| English | | **6ES7 498-8AA05-8BA0** |
| French | | **6ES7 498-8AA05-8CA0** |
| Spanish | | **6ES7 498-8AA05-8DA0** |
| Italian | | **6ES7 498-8AA05-8EA0** |
| **S7-400 operation list** | | |
| German | | **6ES7 498-8AA05-8AN0** |
| English | | **6ES7 498-8AA05-8BN0** |
| French | | **6ES7 498-8AA05-8CN0** |
| Spanish | | **6ES7 498-8AA05-8DN0** |
| Italian | | **6ES7 498-8AA05-8EN0** |

| | | Order No. |
|---|---|---|
| **Manual "Communication for SIMATIC S7-300/-400"** | | |
| German | | **6ES7 398-8EA00-8AA0** |
| English | | **6ES7 398-8EA00-8BA0** |
| French | | **6ES7 398-8EA00-8CA0** |
| Spanish | | **6ES7 398-8EA00-8DA0** |
| Italian | | **6ES7 398-8EA00-8EA0** |
| **SIMATIC Manual Collection** | D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | | |
| **SIMATIC Manual Collection update service for 1 year** | D) | **6ES7 998-8XC01-8YE2** |
| Current "Manual Collection" DVD and the three subsequent updates | | |
| **Brochure "SIMATIC S7-400 programmable controller - Design and application"** | | |
| German | | **6ES7 498-8AA00-8AB0** |
| English | | **6ES7 498-8AA00-8BB0** |
| **RS 485 bus connector with 90° cable outlet** | | |
| Max. transmission rate 12 Mbit/s | | |
| Without PG interface | | **6ES7 972-0BA12-0XA0** |
| With PG interface | | **6ES7 972-0BB12-0XA0** |
| **RS 485 bus connector with angled cable outlet** | | |
| Max. transmission rate 12 Mbit/s | | |
| Without PG interface | | **6ES7 972-0BA41-0XA0** |
| With PG interface | | **6ES7 972-0BB41-0XA0** |
| **RS 485 bus connector with 90° cable outlet for Fast Connect system** | | |
| Max. transmission rate 12 Mbit/s | | |
| Without PG interface | | **6ES7 972-0BA50-0XA0** |
| With PG interface | | **6ES7 972-0BB50-0XA0** |
| **RS 485 bus connector with axial cable outlet** | | |
| For SIMATIC OP, for connection to PPI, MPI, PROFIBUS | | **6GK1 500-0EA02** |
| **PROFIBUS FastConnect bus cable** | | |
| Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m | | **6XV1 830-0EH10** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

# CPU 414

## Overview

- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Integrated PROFINET functions in CPU 414-3 PN/DP



## Technical specifications

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| **Product status** | | | |
| Hardware product status | | | 1 |
| Firmware version | V 5.0 | V5.0 | V5.0 |
| Associated programming package | STEP 7 V5.3 SP2 or higher with HW update | STEP 7 V5.3 SP2 or higher with HW update | STEP 7 V5.4 SP1 or higher |
| **Voltages and currents** | | | |
| Feeding of external buffer voltage to CPU | 5 to 15 V DC | 5 to 15 V DC | 5 to 15 V DC |
| **Current consumption** | | | |
| from backplane bus 5 V DC, max. | 1.1 A | 1.3 A | 1.4 A |
| from interface 5 V DC, max. | 90 mA; At each DP interface | 90 mA; At each DP interface | 90 mA; At each DP interface |
| Power loss, typ. | 4 W | 4,5 W | 5,5 W |
| **Backup battery** | | | |
| Buffer current, typ. | 125 µA; Valid up to 40°C | 125 µA; Valid up to 40°C | 125 µA; Valid up to 40°C |
| Buffer current, max. | 550 µA | 550 µA | 550 µA |
| **Memory** | | | |
| Type of storage | | | |
| • RAM | | | |
| - integrated (for program) | 0.5 MByte | 1.4 MByte | 1.4 MByte |
| - integrated (for data) | 0.5 MByte | 1.4 MByte | 1.4 MByte |
| - expandable | No | No | No |
| • Load memory | | | |
| - expandable FEPROM | Yes | Yes | Yes |
| - expandable FEPROM, max. | 64 MByte | 64 MByte | 64 MByte |
| - integrated RAM, max. | 512 KByte | 512 KByte | 512 KByte |
| - expandable RAM | Yes | Yes | Yes |
| - expandable RAM, max. | 64 MByte | 64 MByte | 64 MByte |
| Backup | | | |
| • present | Yes | Yes | Yes |
| • with battery | Yes | Yes | Yes; All data |
| • without battery | No | No | No |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| **CPU/blocks** | | | |
| DB | | | |
| • Number, max. | 6,000; Number range: 1 to 16,000 | 6,000; Number range: 1 to 16,000 | 6,000; Number range: 1 to 16,000 |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| FB | | | |
| • Number, max. | 3,000; Number range: 0 to 7999 | 3,000; Number range: 0 to 7999 | 3,000; Number range: 0 to 7999 |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| FC | | | |
| • Number, max. | 3,000; Number range: 0 to 7,999 | 3,000; Number range: 0 to 7,999 | 3,000; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| OB | | | |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| Nesting depth | | | |
| • per priority class | 24 | 24 | 24 |
| • additional within an error OB | 1 | 1 | 1 |
| **CPU/processing times** | | | |
| for bit operations, min. | 45 ns | 45 ns | 45 ns |
| for word operations, min. | 45 ns | 45 ns | 45 ns |
| for fixed point arithmetic, min. | 45 ns | 45 ns | 45 ns |
| for floating point arithmetic, min. | 135 ns | 135 ns | 135 ns |
| **Times/counters and their remanence** | | | |
| S7 counter | | | |
| • Number | 2,048 | 2,048 | 2,048 |
| • Remanence | | | |
| - adjustable | Yes | Yes | Yes |
| - lower limit | 0 | 0 | 0 |
| - upper limit | 2,047 | 2,047 | 2,047 |
| - preset | From Z 0 to Z 7 | From Z 0 to Z 7 | From Z 0 to Z 7 |
| • Counting range | | | |
| - lower limit | 0 | 0 | 0 |
| - upper limit | 999 | 999 | 999 |
| IEC counter | | | |
| • present | Yes | Yes | Yes |
| • Type | SFB | SFB | SFB |
| S7 times | | | |
| • Number | 2,048 | 2,048 | 2,048 |
| • Remanence | | | |
| - adjustable | Yes | Yes | Yes |
| - lower limit | 0 | 0 | 0 |
| - upper limit | 2,047 | 2,047 | 2,047 |
| - preset | | No timers retentive | No timers retentive |
| • Time range | | | |
| - lower limit | 10 ms | 10 ms | 10 ms |
| - upper limit | 9,990 s | 9,990 s | 9,990 s |
| IEC timer | | | |
| • present | Yes | Yes | Yes |
| • Type | SFB | SFB | SFB |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| **Data areas and their remanence** | | | |
| Remanent data area, total | Total working and load memory (with backup battery) | Total working and load memory (with backup battery) | Total working and load memory (with backup battery) |
| Flag | | | |
| • Number, max. | 8 KByte | 8 KByte | 8 KByte |
| • Remanence available | Yes | Yes | Yes |
| • Number of clock memories | 8; (in 1 memory byte) | 8; (in 1 memory byte) | 8; (in 1 memory byte) |
| **Address area** | | | |
| I/O address area | | | |
| • Inputs | 8 KByte | 8 KByte | 8 KByte |
| • Outputs | 8 KByte | 8 KByte | 8 KByte |
| • of which, distributed | | | |
| - MPI/DP interface, inputs | 2 KByte | 2 KByte | 2 KByte |
| - MPI/DP interface, outputs | 2 KByte | 2 KByte | 2 KByte |
| - DP interface, inputs | 6 KByte | 6 KByte | 6 KByte |
| - DP interface, outputs | 6 KByte | 6 KByte | 6 KByte |
| - PN interface, inputs | | | 8 KByte |
| - PN interface, outputs | | | 8 KByte |
| Process image | | | |
| • Inputs, adjustable | 8 KByte | 8 KByte | 8 KByte |
| • Outputs, adjustable | 8 KByte | 8 KByte | 8 KByte |
| • Inputs, preset | 256 Byte | 256 Byte | 256 Byte |
| • Outputs, preset | 256 Byte | 256 Byte | 256 Byte |
| • consistent data, max. | 244 Byte | 244 Byte | 244 Byte |
| • Access to consistent data in process image | Yes | Yes | Yes |
| Subprocess images | | | |
| • Number of subprocess images, max. | 15 | 15 | 15 |
| Digital channels | | | |
| • Inputs | 65,536 | 65,536 | 65,536 |
| • Outputs | 65,536 | 65,536 | 65,536 |
| • Inputs, of which central | 65,536 | 65,536 | 65,536 |
| • Outputs, of which central | 65,536 | 65,536 | 65,536 |
| Analog channels | | | |
| • Inputs | 4,096 | 4,096 | 4,096 |
| • Outputs | 4,096 | 4,096 | 4,096 |
| • Inputs, of which central | 4,096 | 4,096 | 4,096 |
| • Outputs, of which central | 4,096 | 4,096 | 4,096 |
| **Hardware config.** | | | |
| connectable OPs | 31 | 31 | 31 |
| Central devices, max. | 1 | 1 | 1 |
| Expansion devices, max. | 21 | 21 | 21 |
| Multicomputing | Yes; Max. 4 CPUs (with UR1 or UR2) | Yes; Max. 4 CPUs (with UR1 or UR2) | Yes; Max. 4 CPUs (with UR1 or UR2) |
| IM | | | |
| • Number of connectable IMs (total), max. | 6 | 6 | 6 |
| • Number of connectable IM 460s, max. | 6 | 6 | 6 |
| • Number of connectable IM 463s, max. | 4; IM 463-2 | 4; IM 463-2 | 4; IM 463-2 |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| Number of DP masters | | | |
| • integrated | 2 | 2 | 1 |
| • via IM 467 | 4 | 4 | 4 |
| • via CP | 10; CP 443-5 Extended | 10; CP 443-5 Extended | 10; CP 443-5 Extended |
| • Mixed mode IM + CP permitted | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode |
| • via interface module | 0 | 1 | 1; IF 964-DP |
| • Number of pluggable S5 modules (via adapter capsule in central device), max. | 6 | 6 | 6 |
| Number of IO controllers | | | |
| • integrated | | | 1 |
| • via CP | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller |
| Number of operable FMs and CPs (recommended) | | | |
| • FM | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • CP, point-to-point | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • PROFIBUS and Ethernet CPs | 14; Of which 10 CP or IM max. as DP master and PN controller | 14; Of which 10 CP or IM max. as DP master and PN controller | 14; Of which 10 CP/IM max. as DP master and PN controller |
| **Time** | | | |
| Clock | | | |
| • Hardware clock (real-time clock) | Yes | Yes | Yes |
| • buffered and synchronizable | Yes | Yes | Yes |
| • Resolution | 1 ms | 1 ms | 1 ms |
| Operating hours counter | | | |
| • Number | 8 | 8 | 8 |
| Clock synchronization | | | |
| • supports | Yes | Yes | Yes |
| • to MPI, Master | Yes | Yes | Yes |
| • to MPI, Slave | Yes | Yes | Yes |
| • to DP, Master | Yes | Yes | Yes |
| • to DP, Slave | Yes | Yes | Yes |
| • in AS, Master | Yes | Yes | Yes |
| • in AS, Slave | Yes | Yes | Yes |
| • on Ethernet via NTP | | | Yes; als Client |
| • to IF 964 DP | | Yes | Yes |
| **S7 message functions** | | | |
| Number of login stations for message functions, max. | 31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC) | 31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC) | 31; Max. 31 with alarm_S and alarm_D (OP's); max. 8 with alarm_8 and alarm_P (e.g. WinCC) |
| Symbol-related messages | Yes | Yes | Yes |
| Number of messages | | | |
| • overall, max. | 512 | 512 | 512 |
| Block related messages | Yes | Yes | Yes |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| Alarm 8-blocks | Yes | Yes | Yes |
| Instrumentation & control messages | Yes | Yes | Yes |
| **Test commissioning functions** | | | |
| Status/control | | | |
| • Status/control variable | Yes | Yes | Yes |
| Forcing | | | |
| • Forcing | Yes | Yes | Yes |
| Status block | Yes | Yes | Yes |
| Single step | Yes | Yes | Yes |
| Number of breakpoints | 4 | 4 | 4 |
| Diagnostic buffer | | | |
| • present | Yes | Yes | Yes |
| • Number of entries, max. | 400 | 3.200 | 3.200 |
| • adjustable | Yes | Yes | Yes |
| • preset | 120 | 120 | 120 |
| **Communication functions** | | | |
| PG/OP communication | Yes | Yes | Yes |
| Routing | Yes | Yes | Yes |
| Global data communication | | | |
| • supported | Yes | Yes | Yes |
| • Size of GD packets, max. | 54 Byte | 54 Byte | 54 Byte |
| S7 basic communication | | | |
| • supported | Yes | Yes | Yes |
| • Useful data per job, max. | 76 Byte | 76 Byte | 76 Byte |
| S7 communication | | | |
| • supported | Yes | Yes | Yes |
| • Useful data per job, max. | 64 KByte | 64 KByte | 64 KByte |
| S5-compatible communication | | | |
| • supported | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) |
| • Useful data per job, max. | 8 KByte | 8 KByte | 8 KByte |
| Standard communication (FMS) | | | |
| • supported | Yes; Via CP and loadable FB | Yes; Via CP and loadable FB | Yes; Via CP and loadable FB |
| Web server | No; Via CP | No; Via CP | Yes |
| Open IE communication | | | |
| • TCP/IP | | | Yes |
| - Number of connections, max. | | | 32 |
| - Data length, max. | | | 32 KByte |
| • ISO-on-TCP (RFC1006) | Via CP 443-1 Adv. and loadable FB | Via CP 443-1 Adv. and loadable FB | Yes |
| - Number of connections, max. | | | 32 |
| - Data length, max. | 1452 | 1452 | 32 KByte; 1452 bytes via CP 443-1 Adv. |
| • UDP | | | Yes |
| - Number of connections, max. | | | 32 |
| - Data length, max. | | | 1,472 Byte |
| Number of connections | | | |
| • overall | 32 | 32 | 32 |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| PROFINET CBA<br>(at set setpoint communication load) | | | |
| • Number of remote interconnection partners | | | 32 |
| • Number of functions, master/slave | | | 150 |
| • Total of all master/slave connections | | | 4.500 |
| • Data length of all incoming connections master/slave, max. | | | 45,000 Byte |
| • Data length of all outgoing connections master/slave, max. | | | 45,000 Byte |
| • Number of device-internal and PROFIBUS interconnections | | | 1.000 |
| • Data length of device-internal and PROFIBUS interconnections, max. | | | 16,000 Byte |
| • Data length per connection, max. | | | 2,000 Byte |
| • Remote interconnections with acyclic transmission | | | |
| - Sampling frequency: sampling interval, min. | | | 200 ms; Depending on preset communcation load, number of interconnections and data length used |
| - Number of incoming interconnections | | | 250 |
| - Number of outgoing interconnections | | | 250 |
| - Data length of all incoming interconnections, max. | | | 8,000 Byte |
| - Data length of all outgoing interconnections, max. | | | 8,000 Byte |
| - Data length per connection, max. | | | 2,000 Byte |
| • Remote interconnections with cyclic transmission | | | |
| - Transmission frequency: transmission interval, min. | | | 1 ms; Depending on preset communication load, number of interconnections and data length used |
| - Number of incoming interconnections | | | 300 |
| - Number of outgoing interconnections | | | 300 |
| - Data length of all incoming interconnections, max. | | | 4,800 Byte |
| - Data length of all outgoing interconnections, max. | | | 4,800 Byte |
| - Data length per connection, max. | | | 250 Byte |
| • HMI variables via PROFINET (acyclic) | | | |
| - Number of log-in stations for HMI variables (PN OPC/iMap) | | | 2x PN OPC/1x iMap |
| - HMI variable updating | | | 500 ms |
| - Number of HMI variables | | | 1,000 |
| - Data length of all HMI variables, max. | | | 32,000 Byte |
| • PROFIBUS proxy functionality | | | |
| - supported | | | Yes; 32 PROFIBUS slaves max. connectable |
| - Data length per connection, max. | | | 240 Byte; Slave-dependent |
| **1st interface** | | | |
| Physics | RS 485 / PROFIBUS | RS 485 / PROFIBUS | RS 485 / PROFIBUS + MPI |
| isolated | Yes | Yes | Yes |
| Functionality | | | |
| • MPI | Yes | Yes | Yes |
| • DP master | Yes | Yes | Yes |
| • DP slave | Yes | Yes | Yes |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| MPI | | | |
| • Number of connections | 32 | 32 | 32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1 |
| • Services | | | |
| - PG/OP communication | Yes | Yes | Yes |
| - Routing | Yes | Yes | Yes |
| - Global data communication | Yes | Yes | Yes |
| - S7 basic communication | Yes | Yes | Yes |
| - S7 communication | Yes | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | 12 Mbit/s |
| DP master | | | |
| • Number of connections, max. | 16 | 16 | 16 |
| • Services | | | |
| - PG/OP communication | Yes | Yes | Yes |
| - Routing | Yes | Yes | Yes |
| - S7 basic communication | Yes | Yes | Yes |
| - S7 communication | Yes | Yes | Yes |
| - Equidistance support | Yes | Yes | Yes |
| - Activation/deactivation of DP slaves | Yes | Yes | Yes |
| - direct data exchange (cross traffic) | Yes | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | 12 Mbit/s |
| • Number of DP slaves, max. | 32 | 32 | 32 |
| • Address area | | | |
| - Inputs, max. | 2 KByte | 2 KByte | 2 KByte |
| - Outputs, max. | 2 KByte | 2 KByte | 2 KByte |
| • Useful data per DP slave | | | |
| - Inputs, max. | 244 Byte | 244 Byte | 244 Byte |
| - Outputs, max. | 244 Byte | 244 Byte | 244 Byte |
| DP slave | | | |
| • Number of connections | 16 | 16 | 16 |
| • Services | | | |
| - Routing | Yes | Yes | Yes |
| - Status/control | Yes | Yes | Yes |
| - Programming | Yes | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | 12 Mbit/s |
| • Transfer memory | | | |
| - Inputs | 244 Byte | 244 Byte | 244 Byte |
| - Outputs | 244 Byte | 244 Byte | 244 Byte |
| • Address area, max. | 32 | 32 | 32; Virtual slots |
| • Useful data per address area, max. | 32 Byte | 32 Byte | 32 Byte |
| • Useful data per address area, of which consistent, max. | 32 Byte | 32 Byte | 32 Byte |
| **2nd interface** | | | |
| Physics | RS 485 / PROFIBUS | RS 485 / PROFIBUS | Ethernet |
| isolated | Yes | Yes | Yes |
| Functionality | | | |
| • DP master | Yes | Yes | No |
| • DP slave | Yes | Yes | No |
| • PROFINET IO controller | | | Yes |
| • PROFINET CBA | | | Yes |
| • Point-to-point coupling | | | No |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| DP master | | | |
| • Number of connections, max. | 16 | 16 | |
| • Services | | | |
| - PG/OP communication | Yes | Yes | |
| - Routing | Yes | Yes | |
| - S7 basic communication | Yes | Yes | |
| - S7 communication | Yes | Yes | |
| - Equidistance support | Yes | Yes | |
| - Activation/deactivation of DP slaves | Yes | Yes | |
| - direct data exchange (cross traffic) | Yes | Yes | |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | |
| • Number of DP slaves, max. | 96 | 96 | |
| • Address area | | | |
| - Inputs, max. | 6 KByte | 6 KByte | |
| - Outputs, max. | 6 KByte | 6 KByte | |
| • Useful data per DP slave | | | |
| - Inputs, max. | 244 Byte | 244 Byte | |
| - Outputs, max. | 244 Byte | 244 Byte | |
| DP slave | | | |
| • Number of connections | 16 | 16 | |
| • Services | | | |
| - Routing | Yes | Yes | |
| - Status/control | Yes | Yes | |
| - Programming | Yes | Yes | |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | |
| • Transfer memory | | | |
| - Inputs | 244 Byte | 244 Byte | |
| - Outputs | 244 Byte | 244 Byte | |
| • Address area, max. | 32 | 32 | |
| • Useful data per address area, max. | 32 Byte | 32 Byte | |
| • Useful data per address area, of which consistent, max. | 32 Byte | 32 Byte | |
| PROFINET CBA | | | |
| • Acyclic transmission | | | Yes |
| • Cyclic transmission | | | Yes |
| PROFINET IO controller | | | |
| • Services | | | |
| - PG/OP communication | | | Yes |
| - Routing | | | Yes; Routing of PG functions |
| - S7 communication | | | Yes |
| - open IE communication | | | Yes |
| • Transmission rate, min. | | | 10 Mbit/s |
| • Transmission speed, max. | | | 100 Mbit/s |
| • Number of connectable IO-devices, max. | | | 256 |
| • Updating time | | | 250 µs to 512 ms; minimum value dependent on preset communication share for PROFINET I/O, of number of I/O devices and number of configured user data |
| • Address area | | | |
| - Inputs, max. | | | 8 KByte |
| - Outputs, max. | | | 8 KByte |
| • Useful data consistency, max. | | | 255 Byte; incl. net data accompaniers |

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## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| **3rd interface** | | | |
| Type of interfaces | | Pluggable interface module (IF), technical specifications as for 2nd interface | Pluggable interface module (IF) |
| Pluggable interface module | | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) |
| Physics | | | RS 485 / PROFIBUS |
| isolated | | | Yes |
| Power supply to interface (15 to 30 V DC), max. | | | 150 mA; max. 150 mA |
| Number of connection resources | | | 16 |
| Functionality | | | |
| • MPI | | | No |
| • DP slave | | | Yes |
| • DP master | | | Yes |
| DP master | | | |
| • Number of connections, max. | | | 16 |
| • Services | | | |
| - PG/OP communication | | | Yes |
| - Routing | | | Yes |
| - Global data communication | | | No |
| - S7 basic communication | | | Yes |
| - S7 communication | | | Yes |
| - Equidistance support | | | Yes |
| - SYNC/FREEZE | | | Yes |
| - Activation/deactivation of DP slaves | | | Yes |
| - Direct data exchange | | | Yes |
| • Transmission rate, max. | | | 12 Mbit/s |
| • Number of DP slaves, max. | | | 96 |
| • Address area | | | |
| - Inputs, max. | | | 6 KByte |
| - Outputs, max. | | | 6 KByte |
| • Useful data per DP slave | | | |
| - Useful data per DP slave, max. | | | 244 Byte |
| - Inputs, max. | | | 244 Byte |
| - Outputs, max. | | | 244 Byte |
| - Slots, max. | | | 244 |
| - per slot, max. | | | 128 Byte |
| DP slave | | | |
| • Number of connections | | | 16 |
| • Services | | | |
| - Routing | | | Yes |
| - Programming | | | Yes |
| - Status/control | | | Yes |
| • GSD file | | | http://support.automation.siemens.com/WW/view/de/113652 |
| • Transmission rate, max. | | | 12 Mbit/s |
| • Transfer memory | | | |
| - Inputs | | | 244 Byte |
| - Outputs | | | 244 Byte |
| • Address range, max. | | | 32 |
| • Useful data per address area, max. | | | 32 Byte |
| • Useful data per address area, of which consistent, max. | | | 32 Byte |

## Technical specifications (continued)

| | 6ES7 414-2XK05-0AB0 | 6ES7 414-3XM05-0AB0 | 6ES7 414-3EM05-0AB0 |
|---|---|---|---|
| **Isochronous mode** | | | |
| Useful data per isochronous slave, max. | 244 Byte | 244 Byte | 244 Byte |
| Equidistance | Yes | Yes | Yes |
| Shortest clock pulse | 1 ms; 0.5 ms without use of SFC 126, 127 | 1 ms; 0.5 ms without use of SFC 126, 127 | 1 ms; Without use of SFC 126 and 127 up to 0.5 ms |
| **CiR configuration in RUN** | | | |
| CiR synchronization time, basic load | 100 ms | 100 ms | 100 ms |
| CiR synchronization time, time per I/O slave | 80 µs | 80 µs | 80 µs |
| **CPU/programming** | | | |
| Configuration software | | | |
| • STEP 7 | Yes | Yes | Yes |
| Programming language | | | |
| • STEP 7 | | | Yes |
| • LAD | Yes | Yes | Yes |
| • FUP | Yes | Yes | Yes |
| • AWL | Yes | Yes | Yes |
| • SCL | Yes | Yes | Yes |
| • CFC | Yes | Yes | Yes |
| • GRAPH | Yes | Yes | Yes |
| • HiGraph | Yes | Yes | Yes |
| Nesting levels | 7 | 7 | 7 |
| User program protection/password protection | Yes | Yes | Yes |
| **Dimensions** | | | |
| Width | 25 mm | 50 mm | 50 mm |
| Height | 290 mm | 290 mm | 290 mm |
| Depth | 219 mm | 219 mm | 219 mm |
| **Dimensions** | | | |
| Required slots | 1 | 2 | 2 |
| **Weights** | | | |
| Weight, approx. | 720 g | 880 g | 900 g |

## CPU 414



| Ordering data | | Order No. |
|---|---|---|
| **CPU 414-2** | A) | **6ES7 414-2XK05-0AB0** |
| Main memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels | | |
| **CPU 414-3** | A) | **6ES7 414-3XM05-0AB0** |
| Main memory 2.8 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, module slots for 1 IF module, incl. slot number labels | | |
| **CPU 414-3 PN/DP** | A) | **6ES7 414-3EM05-0AB0** |
| Main memory 2.8 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, slot for memory card, module slot for 1 IF module, incl. slot number labels | | |
| **Memory Card RAM** | | |
| 64 KB | | **6ES7 952-0AF00-0AA0** |
| 256 KB | | **6ES7 952-1AH00-0AA0** |
| 1 MB | | **6ES7 952-1AK00-0AA0** |
| 2 MB | | **6ES7 952-1AL00-0AA0** |
| 4 MB | | **6ES7 952-1AM00-0AA0** |
| 8 MB | | **6ES7 952-1AP00-0AA0** |
| 16 MB | | **6ES7 952-1AS00-0AA0** |
| 64 MB | | **6ES7 952-1AY00-0AA0** |
| **FEPROM memory card** | | |
| 64 KB | | **6ES7 952-0KF00-0AA0** |
| 256 KB | | **6ES7 952-0KH00-0AA0** |
| 1 MB | | **6ES7 952-1KK00-0AA0** |
| 2 MB | | **6ES7 952-1KL00-0AA0** |
| 4 MB | | **6ES7 952-1KM00-0AA0** |
| 8 MB | | **6ES7 952-1KP00-0AA0** |
| 16 MB | | **6ES7 952-1KS00-0AA0** |
| 32 MB | | **6ES7 952-1KT00-0AA0** |
| 64 MB | | **6ES7 952-1KY00-0AA0** |
| **MPI cable** | | **6ES7 901-0BF00-0AA0** |
| For connecting SIMATIC S7 and the PG through MPI; 5 m in length | | |
| **IF 964-DP interface module** | | **6ES7 964-2AA04-0AB0** |
| To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 | | |
| **Slot number plates** | | **6ES7 912-0AA00-0AA0** |
| 1 set (spare part) | | |

| | | Order No. |
|---|---|---|
| **Manual "SIMATIC S7-400 programmable controller"** | | |
| incl. instruction list | | |
| German | | **6ES7 498-8AA05-8AA0** |
| English | | **6ES7 498-8AA05-8BA0** |
| French | | **6ES7 498-8AA05-8CA0** |
| Spanish | | **6ES7 498-8AA05-8DA0** |
| Italian | | **6ES7 498-8AA05-8EA0** |
| **S7-400 operation list** | | |
| German | | **6ES7 498-8AA05-8AN0** |
| English | | **6ES7 498-8AA05-8BN0** |
| French | | **6ES7 498-8AA05-8CN0** |
| Spanish | | **6ES7 498-8AA05-8DN0** |
| Italian | | **6ES7 498-8AA05-8EN0** |
| **Manual "Communication for SIMATIC S7-300/-400"** | | |
| German | | **6ES7 398-8EA00-8AA0** |
| English | | **6ES7 398-8EA00-8BA0** |
| French | | **6ES7 398-8EA00-8CA0** |
| Spanish | | **6ES7 398-8EA00-8DA0** |
| Italian | | **6ES7 398-8EA00-8EA0** |
| **SIMATIC Manual Collection** | D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | | |
| **SIMATIC Manual Collection update service for 1 year** | D) | **6ES7 998-8XC01-8YE2** |
| Current "Manual Collection" DVD and the three subsequent updates | | |
| **Brochure "SIMATIC S7-400 programmable controller - Design and application"** | | |
| German | | **6ES7 498-8AA00-8AB0** |
| English | | **6ES7 498-8AA00-8BB0** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

| Ordering data | Order No. |
|---|---|
| ***PROFIBUS bus components*** | |
| **RS 485 bus connector with 90° cable outlet** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA12-0XA0** |
| With PG interface | **6ES7 972-0BB12-0XA0** |
| **RS 485 bus connector with angled cable outlet** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA41-0XA0** |
| With PG interface | **6ES7 972-0BB41-0XA0** |
| **RS 485 bus connector with 90° cable outlet for Fast Connect system** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA50-0XA0** |
| With PG interface | **6ES7 972-0BB50-0XA0** |
| **RS 485 bus connector with axial cable outlet** | |
| For SIMATIC OP, for connection to PPI, MPI, PROFIBUS | **6GK1 500-0EA02** |
| **PROFIBUS FastConnect bus cable** | |
| Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m | **6XV1 830-0EH10** |
| **RS 485 repeater for PROFIBUS** | **6ES7 972-0AA01-0XA0** |
| Data transfer rate up to 12 Mbit/s; 24 V DC; IP 20 housing | |

| | Order No. |
|---|---|
| ***PROFINET bus components*** | |
| **IE FC TP standard cable GP 2x2** | **6XV1 840-2AH10** |
| 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; | |
| Sold by the meter | |
| **FO Standard Cable GP (50/125)** | **6XV1 873-2A** |
| Standard cable, splittable, UL approval, sold by the meter | |
| **SCALANCE X204-2 Industrial Ethernet switch** | **6GK5 204-2BB00-2AA3** |
| Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports | |
| **IE FC RJ45 plugs** | |
| RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables | |
| **IE FC RJ45 plug 180** | |
| 180° cable outlet | |
| 1 unit | **6GK1 901-1BB10-2AA0** |
| 10 units | **6GK1 901-1BB10-2AB0** |
| 50 units | **6GK1 901-1BB10-2AE0** |
| **PROFIBUS/PROFINET bus components** | See Catalogs IK PI, CA 01 |
| For establishing MPI/PROFIBUS/PROFINET communication | |

## CPU 416

### Overview

- High-performance CPUs in the high-end performance range
- Applicable for plants with high requirements in the high-end performance range
- Integrated PROFINET functions in CPU 416-3 PN/DP

### Technical specifications

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| **Product status** | | | |
| Firmware version | V5.0 | V5.0 | V5.0 |
| Associated programming package | STEP 7 V5.3 SP2 or higher with HW update | STEP 7 V5.3 SP2 or higher with HW update | STEP 7 V5.4 SP1 or higher |
| **Voltages and currents** | | | |
| Feeding of external buffer voltage to CPU | 5 to 15 V DC | 5 to 15 V DC | 5 to 15 V DC |
| **Current consumption** | | | |
| from backplane bus 5 V DC, max. | 1.1 A | 1.3 A | 1.4 A |
| from interface 5 V DC, max. | 90 mA; At each DP interface | 90 mA; At each DP interface | 90 mA; At each DP interface |
| Power loss, typ. | 4 W | 4.5 W | 5.5 W |
| **Backup battery** | | | |
| Buffer current, typ. | 125 µA; Valid up to 40°C | 125 µA; Valid up to 40°C | 125 µA; Valid up to 40°C |
| Buffer current, max. | 550 µA | 550 µA | 550 µA |
| **Memory** | | | |
| Type of storage | | | |
| • RAM | | | |
| - integrated (for program) | 2.8 MByte | 5.6 MByte | 5.6 MByte |
| - integrated (for data) | 2.8 MByte | 5.6 MByte | 5.6 MByte |
| - expandable | No | No | No |
| • Load memory | | | |
| - expandable FEPROM | Yes | Yes | Yes; with Memory Card (FLASH) |
| - expandable FEPROM, max. | 64 MByte | 64 MByte | 64 MByte |
| - integrated RAM, max. | 1 MByte | 1 MByte | 1 MByte |
| - expandable RAM | Yes | Yes | Yes; With Memory Card (RAM) |
| - expandable RAM, max. | 64 MByte | 64 MByte | 64 MByte |
| Backup | | | |
| • present | Yes | Yes | Yes |
| • with battery | Yes | Yes | Yes |
| • without battery | No | No | No |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| **CPU/blocks** | | | |
| DB | | | |
| • Number, max. | 10,000; Number range: 1 to 16,000 | 10,000; Number range: 1 to 16,000 | 10,000; Number range: 1 to 16,000 |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| FB | | | |
| • Number, max. | 5,000; Number range: 0 to 7999 | 5,000; Number range: 0 to 7999 | 5,000; Number range: 0 to 7999 |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| FC | | | |
| • Number, max. | 5,000; Number range: 0 to 7,999 | 5,000; Number range: 0 to 7,999 | 5,000; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| OB | | | |
| • Size, max. | 64 KByte | 64 KByte | 64 KByte |
| Nesting depth | | | |
| • per priority class | 24 | 24 | 24 |
| • additional within an error OB | 2 | 2 | 2 |
| **CPU/processing times** | | | |
| for bit operations, min. | 30 ns | 30 ns | 30 ns |
| for word operations, min. | 30 ns | 30 ns | 30 ns |
| for fixed point arithmetic, min. | 30 ns | 30 ns | 30 ns |
| for floating point arithmetic, min. | 90 ns | 90 ns | 90 ns |
| **Times/counters and their remanence** | | | |
| S7 counter | | | |
| • Number | 2,048 | 2,048 | 2,048 |
| • Remanence | | | |
| - adjustable | Yes | Yes | Yes |
| - lower limit | 0 | 0 | 0 |
| - upper limit | 2.047 | 2.047 | 2.047 |
| - preset | From Z 0 to Z 7 | From Z 0 to Z 7 | From Z 0 to Z 7 |
| • Counting range | | | |
| - lower limit | 0 | 0 | 0 |
| - upper limit | 999 | 999 | 999 |
| IEC counter | | | |
| • present | Yes | Yes | Yes |
| • Type | SFB | SFB | SFB |
| S7 times | | | |
| • Number | 2,048 | 2,048 | 2,048 |
| • Remanence | | | |
| - adjustable | Yes | Yes | Yes |
| - lower limit | 0 | 0 | 0 |
| - upper limit | 2,047 | 2,047 | 2,047 |
| - preset | No timers retentive | No timers retentive | No timers retentive |
| • Time range | | | |
| - lower limit | 10 ms | 10 ms | 10 ms |
| - upper limit | 9,990 s | 9,990 s | 9,990 s |
| IEC timer | | | |
| • present | Yes | Yes | Yes |
| • Type | SFB | SFB | SFB |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| **Data areas and their remanence** | | | |
| Remanent data area, total | Total working and load memory (with backup battery) | Total working and load memory (with backup battery) | Total working and load memory (with backup battery) |
| Flag | | | |
| • Number, max. | 16 KByte | 16 KByte | 16 KByte; Size of bit memory address area |
| • Remanence available | Yes | Yes | Yes |
| • Number of clock memories | 8; (in 1 memory byte) | 8; (in 1 memory byte) | 8; (in 1 memory byte) |
| **Address area** | | | |
| I/O address area | | | |
| • Inputs | 16 KByte | 16 KByte | 16 KByte |
| • Outputs | 16 KByte | 16 KByte | 16 KByte |
| • of which, distributed | | | |
| - MPI/DP interface, inputs | 2 KByte | 2 KByte | 2 KByte |
| - MPI/DP interface, outputs | 2 KByte | 2 KByte | 2 KByte |
| - DP interface, inputs | 8 KByte | 8 KByte | 8 KByte |
| - DP interface, outputs | 8 KByte | 8 KByte | 8 KByte |
| - PN interface, inputs | | | 8 KByte |
| - PN interface, outputs | | | 8 KByte |
| Process image | | | |
| • Inputs, adjustable | 16 KByte | 16 KByte | 16 KByte |
| • Outputs, adjustable | 16 KByte | 16 KByte | 16 KByte |
| • Inputs, preset | 512 Byte | 512 Byte | 512 Byte |
| • Outputs, preset | 512 Byte | 512 Byte | 512 Byte |
| • consistent data, max. | 244 Byte | 244 Byte | 244 Byte |
| • Access to consistent data in process image | Yes | Yes | Yes |
| Subprocess images | | | |
| • Number of subprocess images, max. | 15 | 15 | 15 |
| Digital channels | | | |
| • Inputs | 131,072 | 131,072 | 131,072 |
| • Outputs | 131,072 | 131,072 | 131,072 |
| • Inputs, of which central | 131,072 | 131,072 | 131,072 |
| • Outputs, of which central | 131,072 | 131,072 | 131,072 |
| Analog channels | | | |
| • Inputs | 8,192 | 8,192 | 8,192 |
| • Outputs | 8,192 | 8,192 | 8,192 |
| • Inputs, of which central | 8,192 | 8,192 | 8,192 |
| • Outputs, of which central | 8,192 | 8,192 | 8,192 |
| **Hardware configuration** | | | |
| connectable OPs | 63 | 63 | 63 |
| Central devices, max. | 1 | 1 | 1 |
| Expansion devices, max. | 21 | 21 | 21 |
| Multicomputing | Yes; Max. 4 CPUs (with UR1 or UR2) | Yes; Max. 4 CPUs (with UR1 or UR2) | Yes; Max. 4 CPUs (with UR1 or UR2) |
| IM | | | |
| • Number of connectable IMs (total), max. | 6 | 6 | 6 |
| • Number of connectable IM 460s, max. | 6 | 6 | 6 |
| • Number of connectable IM 463s, max. | 4; IM 463-2 | 4; IM 463-2 | 4; IM 463-2 |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| Number of DP masters | | | |
| • integrated | 2 | 2 | 1 |
| • via IM 467 | 4 | 4 | 4 |
| • via CP | 10; CP 443-5 Extended | 10; CP 443-5 Extended | 10; CP 443-5 Extended |
| • Mixed mode IM + CP permitted | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode |
| • via interface module | 0 | 1 | 1; IF 964-DP |
| • Number of pluggable S5 modules (via adapter capsule in central device), max. | 6 | 6 | 6 |
| Number of IO controllers | | | |
| • integrated | | | 1 |
| • via CP | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller |
| Number of operable FMs and CPs (recommended) | | | |
| • FM | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • CP, point-to-point | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • PROFIBUS and Ethernet CPs | 14; Of which 10 CP or IM max. as DP master and PN controller | 14; Of which 10 CP or IM max. as DP master and PN controller | 14; Of which 10 CP/IM max. as DP master and PN controller |
| **Time** | | | |
| Clock | | | |
| • Hardware clock (real-time clock) | Yes | Yes | Yes |
| • buffered and synchronizable | Yes | Yes | Yes |
| • Resolution | 1 ms | 1 ms | 1 ms |
| Operating hours counter | | | |
| • Number | 8 | 8 | 8 |
| Clock synchronization | | | |
| • supports | Yes | Yes | Yes |
| • to MPI, Master | Yes | Yes | Yes |
| • to MPI, Slave | Yes | Yes | Yes |
| • to DP, Master | Yes | Yes | Yes |
| • to DP, Slave | Yes | Yes | Yes |
| • in AS, Master | Yes | Yes | Yes |
| • in AS, Slave | Yes | Yes | Yes |
| • on Ethernet via NTP | Via CP | Via CP | Yes; as client |
| • to IF 964 DP | | Yes | Yes |
| **S7 message functions** | | | |
| Number of login stations for message functions, max. | 63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 12 with ALARM_8 and ALARM_P (e.g. WinCC) | 63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 12 with ALARM_8 and ALARM_P (e.g. WinCC) | 63; Max. 63 with alarm_S and alarm_D (OP's); max. 12 with alarm_8 and alarm_P (e.g. WinCC) |
| Symbol-related messages | Yes | Yes | Yes |
| Number of messages | | | |
| • overall, max. | 1,024 | 1,024 | 1,024 |
| Block related messages | Yes | Yes | Yes |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| Alarm 8-blocks | Yes | Yes | Yes |
| Instrumentation & control messages | Yes | Yes | Yes |
| **Test commissioning functions** | | | |
| Status/control | | | |
| • Status/control variable | Yes | Yes | Yes |
| Forcing | | | |
| • Forcing | Yes | Yes | Yes |
| Status block | Yes | Yes | Yes |
| Single step | Yes | Yes | Yes |
| Number of breakpoints | 4 | 4 | 4 |
| Diagnostic buffer | | | |
| • present | Yes | Yes | Yes |
| • Number of entries, max. | 3,200 | 3,200 | 3,200 |
| • adjustable | Yes | Yes | Yes |
| • preset | 120 | 120 | 120 |
| **Communication functions** | | | |
| PG/OP communication | Yes | Yes | Yes |
| Routing | Yes | Yes | Yes |
| Global data communication | | | |
| • supported | Yes | Yes | Yes |
| • Size of GD packets, max. | 54 Byte | 54 Byte | 54 Byte |
| S7 basic communication | | | |
| • supported | Yes | Yes | Yes |
| • Useful data per job, max. | 76 Byte | 76 Byte | 76 Byte |
| S7 communication | | | |
| • supported | Yes | Yes | Yes |
| • Useful data per job, max. | 64 KByte | 64 KByte | 64 KByte |
| S5-compatible communication | | | |
| • supported | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) |
| • Useful data per job, max. | 8 KByte | 8 KByte | 8 KByte |
| Standard communication (FMS) | | | |
| • supported | Yes; Via CP and loadable FB | Yes; Via CP and loadable FB | Yes; Via CP and loadable FB |
| Web server | No; Via CP | No; Via CP | Yes; Read-only function |
| Open IE communication | | | |
| • TCP/IP | | | Yes |
| - Number of connections, max. | | | 64 |
| - Data length, max. | | | 32 KByte |
| • ISO-on-TCP (RFC1006) | Via CP 443-1 Adv. and loadable FB | Via CP 443-1 Adv. and loadable FB | Yes |
| - Number of connections, max. | | | 64 |
| - Data length, max. | 1452 | 1452 | 32 KByte; 1452 bytes via CP 443-1 Adv. |
| • UDP | | | Yes |
| - Number of connections, max. | | | 64 |
| - Data length, max. | | | 1,472 Byte |
| Number of connections | | | |
| • overall | 64 | 64 | 64 |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| PROFINET CBA<br>(at set setpoint communication load) | | | |
| • Number of remote interconnection partners | | | 32 |
| • Number of functions, master/slave | | | 150 |
| • Total of all master/slave connections | | | 6,000 |
| • Data length of all incoming connections master/slave, max. | | | 65,000 Byte |
| • Data length of all outgoing connections master/slave, max. | | | 65,000 Byte |
| • Number of device-internal and PROFIBUS interconnections | | | 1,000 |
| • Data length of device-internal and PROFIBUS interconnections, max. | | | 16,000 Byte |
| • Data length per connection, max. | | | 2,000 Byte |
| • Remote interconnections with acyclic transmission | | | |
| - Sampling frequency: sampling interval, min. | | | 200 ms; Depending on preset communcation load, number of interconnections and data length used |
| - Number of incoming interconnections | | | 500 |
| - Number of outgoing interconnections | | | 500 |
| - Data length of all incoming interconnections, max. | | | 16,000 Byte |
| - Data length of all outgoing interconnections, max. | | | 16,000 Byte |
| - Data length per connection, max. | | | 2,000 Byte |
| • Remote interconnections with cyclic transmission | | | |
| - Transmission frequency: transmission interval, min. | | | 1 ms; Depending on preset communication load, number of interconnections and data length used |
| - Number of incoming interconnections | | | 300 |
| - Number of outgoing interconnections | | | 300 |
| - Data length of all incoming interconnections, max. | | | 4,800 Byte |
| - Data length of all outgoing interconnections, max. | | | 4,800 Byte |
| - Data length per connection, max. | | | 250 Byte |
| • HMI variables via PROFINET (acyclic) | | | |
| - Number of log-in stations for HMI variables (PN OPC/iMap) | | | 2x PN OPC/1x iMap |
| - HMI variable updating | | | 500 ms |
| - Number of HMI variables | | | 1,500 |
| - Data length of all HMI variables, max. | | | 48,000 Byte |
| • PROFIBUS proxy functionality | | | |
| - supported | | | Yes; 32 PROFIBUS slaves max. connectable |
| - Data length per connection, max. | | | 240 Byte; Slave-dependent |
| **1st interface** | | | |
| Physics | RS 485 / PROFIBUS | RS 485 / PROFIBUS | RS 485 / PROFIBUS + MPI |
| isolated | Yes | Yes | Yes |
| Functionality | | | |
| • MPI | Yes | Yes | Yes |
| • DP master | Yes | Yes | Yes |
| • DP slave | Yes | Yes | Yes |

5

**Technical specifications** (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| MPI | | | |
| • Number of connections | 44 | 44 | 44 |
| • Services | | | |
| - PG/OP communication | Yes | Yes | Yes |
| - Routing | Yes | Yes | Yes |
| - Global data communication | Yes | Yes | Yes |
| - S7 basic communication | Yes | Yes | Yes |
| - S7 communication | Yes | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | 12 Mbit/s |
| DP master | | | |
| • Number of connections, max. | 32 | 32 | 32; if a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1 |
| • Services | | | |
| - PG/OP communication | Yes | Yes | Yes |
| - Routing | Yes | Yes | Yes |
| - S7 basic communication | Yes | Yes | Yes |
| - S7 communication | Yes | Yes | Yes |
| - Equidistance support | Yes | Yes | Yes |
| - Activation/deactivation of DP slaves | Yes | Yes | Yes |
| - direct data exchange (cross traffic) | Yes | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | 12 Mbit/s |
| • Number of DP slaves, max. | 32 | 32 | 32 |
| • Address area | | | |
| - Inputs, max. | 2 KByte | 2 KByte | 2 KByte |
| - Outputs, max. | 2 KByte | 2 KByte | 2 KByte |
| • Useful data per DP slave | | | |
| - Inputs, max. | 244 Byte | 244 Byte | 244 Byte |
| - Outputs, max. | 244 Byte | 244 Byte | 244 Byte |
| DP slave | | | |
| • Number of connections | 32 | 32 | 32 |
| • Services | | | |
| - Routing | Yes | Yes | Yes; When interface active |
| - Status/control | Yes | Yes | Yes; When interface active |
| - Programming | Yes | Yes | Yes; When interface active |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | 12 Mbit/s |
| • Transfer memory | | | |
| - Inputs | 244 Byte | 244 Byte | 244 Byte |
| - Outputs | 244 Byte | 244 Byte | 244 Byte |
| • Address area, max. | 32 | 32 | 32; Virtual slots |
| • Useful data per address area, max. | 32 Byte | 32 Byte | 32 Byte |
| • Useful data per address area, of which consistent, max. | 32 Byte | 32 Byte | 32 Byte |
| **2nd interface** | | | |
| Physics | RS 485 / PROFIBUS | RS 485 / PROFIBUS | Ethernet |
| isolated | Yes | Yes | Yes |
| Functionality | | | |
| • DP master | Yes | Yes | No |
| • DP slave | Yes | Yes | No |
| • PROFINET IO controller | | | Yes |
| • PROFINET CBA | | | Yes |
| • Point-to-point coupling | | | No |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| DP master | | | |
| • Number of connections, max. | 32 | 32 | |
| • Services | | | |
| - PG/OP communication | Yes | Yes | |
| - Routing | Yes | Yes | |
| - S7 basic communication | Yes | Yes | |
| - S7 communication | Yes | Yes | |
| - Equidistance support | Yes | Yes | |
| - Activation/deactivation of DP slaves | Yes | Yes | |
| - direct data exchange (cross traffic) | Yes | Yes | |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | |
| • Number of DP slaves, max. | 125 | 125 | |
| • Address area | | | |
| - Inputs, max. | 8 KByte | 8 KByte | |
| - Outputs, max. | 8 KByte | 8 KByte | |
| • Useful data per DP slave | | | |
| - Inputs, max. | 244 Byte | 244 Byte | |
| - Outputs, max. | 244 Byte | 244 Byte | |
| DP slave | | | |
| • Number of connections | 32 | 32 | |
| • Services | | | |
| - Routing | Yes | Yes | |
| - Status/control | Yes | Yes | |
| - Programming | Yes | Yes | |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s | |
| • Transfer memory | | | |
| - Inputs | 244 Byte | 244 Byte | |
| - Outputs | 244 Byte | 244 Byte | |
| • Address area, max. | 32 | 32 | |
| • Useful data per address area, max. | 32 Byte | 32 Byte | |
| • Useful data per address area, of which consistent, max. | 32 Byte | 32 Byte | |
| PROFINET CBA | | | |
| • Acyclic transmission | | | Yes |
| • Cyclic transmission | | | Yes |
| PROFINET IO controller | | | |
| • Services | | | |
| - PG/OP communication | | | Yes |
| - Routing | | | Yes; Routing of PG functions |
| - S7 communication | | | Yes |
| - open IE communication | | | Yes |
| • Transmission rate, min. | | | 10 Mbit/s |
| • Transmission speed, max. | | | 100 Mbit/s |
| • Number of connectable IO-devices, max. | | | 256 |
| • Updating time | | | 250 µs to 512 ms; minimum value dependent on preset communication share for PROFINET I/O, of number of I/O devices and number of configured user data |
| • Address area | | | |
| - Inputs, max. | | | 8 KByte |
| - Outputs, max. | | | 8 KByte |
| • Useful data consistency, max. | | | 255 Byte; incl. net data accompaniers |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| **3rd interface** | | | |
| Type of interfaces | | Pluggable interface module (IF), technical specifications as for 2nd interface | Pluggable interface module (IF), technical specifications as for 2nd interface |
| pluggable interface module | | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) |
| Physics | | | RS 485 / PROFIBUS |
| isolated | | | Yes |
| Power supply to interface (15 to 30 V DC), max. | | | 150 mA |
| Number of connection resources | | | 32 |
| Functionality | | | |
| • MPI | | | No |
| • DP slave | | | Yes |
| • DP master | | | Yes |
| DP master | | | |
| • Number of connections, max. | | | 32 |
| • Services | | | |
| - PG/OP communication | | | Yes |
| - Routing | | | Yes |
| - Global data communication | | | No |
| - S7 basic communication | | | Yes |
| - S7 communication | | | Yes |
| - Equidistance support | | | Yes |
| - SYNC/FREEZE | | | Yes |
| - Activation/deactivation of DP slaves | | | Yes |
| - Direct data exchange | | | Yes |
| • Transmission rate, max. | | | 12 Mbit/s |
| • Number of DP slaves, max. | | | 125 |
| • Address area | | | |
| - Inputs, max. | | | 8 KByte |
| - Outputs, max. | | | 8 KByte |
| • Useful data per DP slave | | | |
| - Useful data per DP slave, max. | | | 244 Byte |
| - Inputs, max. | | | 244 Byte |
| - Outputs, max. | | | 244 Byte |
| - Slots, max. | | | 244 |
| - per slot, max. | | | 128 Byte |
| DP slave | | | |
| • Number of connections | | | 32 |
| • Services | | | |
| - Routing | | | Yes; When interface active |
| - Programming | | | Yes; When interface active |
| - Status/control | | | Yes; When interface active |
| • GSD file | | | http://support.automation.siemens.com/WW/view/de/113652 |
| • Transmission rate, max. | | | 12 Mbit/s |
| • Transfer memory | | | |
| - Inputs | | | 244 Byte |
| - Outputs | | | 244 Byte |
| • Address range, max. | | | 32 |
| • Useful data per address area, max. | | | 32 Byte |
| • Useful data per address area, of which consistent, max. | | | 32 Byte |

## Technical specifications (continued)

| | 6ES7 416-2XN05-0AB0 | 6ES7 416-3XR05-0AB0 | 6ES7 416-3ER05-0AB0 |
|---|---|---|---|
| **Isochronous mode** | | | |
| Useful data per isochronoous slave, max. | 244 Byte | 244 Byte | 244 Byte |
| Equidistance | Yes | Yes | Yes |
| shortest clock pulse | 1 ms; 0.5 ms without use of SFC 126, 127 | 1 ms; 0.5 ms without use of SFC 126, 127 | 1 ms; Without use of SFC 126 and 127 up to 0.5 ms |
| **CiR configuration in RUN** | | | |
| CiR synchronization time, basic load | 100 ms | 100 ms | 100 ms |
| CiR synchronization time, time per I/O slave | 40 µs | 40 µs | 40 µs |
| **CPU/programming** | | | |
| Configuration software | | | |
| • STEP 7 | Yes | Yes | Yes |
| Programming language | | | |
| • STEP 7 | | | Yes |
| • LAD | Yes | Yes | Yes |
| • FUP | Yes | Yes | Yes |
| • AWL | Yes | Yes | Yes |
| • SCL | Yes | Yes | Yes |
| • CFC | Yes | Yes | Yes |
| • GRAPH | Yes | Yes | Yes |
| • HiGraph | Yes | Yes | Yes |
| Nesting levels | 7 | 7 | 7 |
| User program protection/password protection | Yes | Yes | Yes |
| **Dimensions** | | | |
| Width | 25 mm | 50 mm | 50 mm |
| Height | 290 mm | 290 mm | 290 mm |
| Depth | 219 mm | 219 mm | 219 mm |
| **Dimensions** | | | |
| Required slots | 1 | 2 | 2 |
| **Weights** | | | |
| Weight, approx. | 720 g | 880 g | 900 g |

## CPU 416



| Ordering data | | Order No. |
|---|---|---|
| **CPU 416-2** | A) | **6ES7 416-2XN05-0AB0** |
| Main memory 5.6 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels | | |
| **CPU 416-3** | A) | **6ES7 416-3XR05-0AB0** |
| Main memory 11.2 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, module slot for 1 IF module, slot for memory card, incl. slot number labels | | |
| **CPU 416-3 PN/DP** | A) | **6ES7 416-3ER05-0AB0** |
| Main memory 11.2 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, module slot for 1 IF submodule, slot for memory card, incl. slot number labels | | |
| **Memory Card RAM** | | |
| 64 KB | | **6ES7 952-0AF00-0AA0** |
| 256 KB | | **6ES7 952-1AH00-0AA0** |
| 1 MB | | **6ES7 952-1AK00-0AA0** |
| 2 MB | | **6ES7 952-1AL00-0AA0** |
| 4 MB | | **6ES7 952-1AM00-0AA0** |
| 8 MB | | **6ES7 952-1AP00-0AA0** |
| 16 MB | | **6ES7 952-1AS00-0AA0** |
| 64 MB | | **6ES7 952-1AY00-0AA0** |
| **FEPROM memory card** | | |
| 64 KB | | **6ES7 952-0KF00-0AA0** |
| 256 KB | | **6ES7 952-0KH00-0AA0** |
| 1 MB | | **6ES7 952-1KK00-0AA0** |
| 2 MB | | **6ES7 952-1KL00-0AA0** |
| 4 MB | | **6ES7 952-1KM00-0AA0** |
| 8 MB | | **6ES7 952-1KP00-0AA0** |
| 16 MB | | **6ES7 952-1KS00-0AA0** |
| 32 MB | | **6ES7 952-1KT00-0AA0** |
| 64 MB | | **6ES7 952-1KY00-0AA0** |
| **MPI cable** | | **6ES7 901-0BF00-0AA0** |
| For connecting SIMATIC S7 and the PG through MPI; 5 m in length | | |
| **IF 964-DP interface module** | | **6ES7 964-2AA04-0AB0** |
| To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 | | |
| **Slot number plates** | | **6ES7 912-0AA00-0AA0** |
| 1 set (spare part) | | |

| | Order No. |
|---|---|
| **Manual "SIMATIC S7-400 programmable controller"** | |
| incl. instruction list | |
| German | **6ES7 498-8AA05-8AA0** |
| English | **6ES7 498-8AA05-8BA0** |
| French | **6ES7 498-8AA05-8CA0** |
| Spanish | **6ES7 498-8AA05-8DA0** |
| Italian | **6ES7 498-8AA05-8EA0** |
| **S7-400 operation list** | |
| German | **6ES7 498-8AA05-8AN0** |
| English | **6ES7 498-8AA05-8BN0** |
| French | **6ES7 498-8AA05-8CN0** |
| Spanish | **6ES7 498-8AA05-8DN0** |
| Italian | **6ES7 498-8AA05-8EN0** |
| **Manual "Communication for SIMATIC S7-300/-400"** | |
| German | **6ES7 398-8EA00-8AA0** |
| English | **6ES7 398-8EA00-8BA0** |
| French | **6ES7 398-8EA00-8CA0** |
| Spanish | **6ES7 398-8EA00-8DA0** |
| Italian | **6ES7 398-8EA00-8EA0** |
| **SIMATIC Manual Collection** D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | |
| **SIMATIC Manual Collection update service for 1 year** D) | **6ES7 998-8XC01-8YE2** |
| Current "Manual Collection" DVD and the three subsequent updates | |
| **Brochure "SIMATIC S7-400 programmable controller - Design and application"** | |
| German | **6ES7 498-8AA00-8AB0** |
| English | **6ES7 498-8AA00-8BB0** |
| ***PROFIBUS bus components*** | see CPU 414, page 5/19 |
| ***PROFINET bus components*** | see CPU 414, page 5/19 |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

## Overview

- The most powerful SIMATIC S7-400 CPU
- Can be used in the most sophisticated installations in the upper performance range
- With two slots for IF modules

## Technical specifications

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| **Product status** | |
| Firmware version | V5.0 |
| Associated programming package | STEP 7 V5.3 SP2 or higher with HW update |
| **Voltages and currents** | |
| Feeding of external buffer voltage to CPU | 5 to 15 V DC |
| **Current consumption** | |
| from backplane bus 5 V DC, max. | 1.8 A |
| Power loss, max. | 6 W |
| **Backup battery** | |
| Buffer current, typ. | 225 µA; Valid up to 40°C |
| Buffer current, max. | 750 µA |
| **Memory** | |
| Type of storage | |
| • RAM | |
| - integrated (for program) | 15 MByte |
| - integrated (for data) | 15 MByte |
| - expandable | No |
| • Load memory | |
| - expandable FEPROM | Yes |
| - expandable FEPROM, max. | 64 MByte |
| - integrated RAM, max. | 1 MByte |
| - expandable RAM | Yes |
| - expandable RAM, max. | 64 MByte |
| Backup | |
| • present | Yes |
| • with battery | Yes |
| • without battery | No |
| **CPU/blocks** | |
| DB | |
| • Number, max. | 16,000; Number range: 1 to 16,000 |
| • Size, max. | 64 KByte |

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| FB | |
| • Number, max. | 8,000; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte |
| FC | |
| • Number, max. | 8,000; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte |
| OB | |
| • Size, max. | 64 KByte |
| Nesting depth | |
| • per priority class | 24 |
| • additional within an error OB | 2 |
| **CPU/processing times** | |
| for bit operations, min. | 18 ns |
| for word operations, min. | 18 ns |
| for fixed point arithmetic, min. | 18 ns |
| for floating point arithmetic, min. | 54 ns |
| **Times/counters and their remanence** | |
| S7 counter | |
| • Number | 2,048 |
| • Remanence | |
| - adjustable | Yes |
| - lower limit | 0 |
| - upper limit | 2.047 |
| - preset | From Z 0 to Z 7 |
| • Counting range | |
| - lower limit | 0 |
| - upper limit | 999 |
| IEC counter | |
| • present | Yes |
| • Type | SFB |

## CPU 417

### Technical specifications (continued)

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| S7 times | |
| • Number | 2,048 |
| • Remanence | |
| - adjustable | Yes |
| - lower limit | 0 |
| - upper limit | 2,047 |
| - preset | No timers retentive |
| • Time range | |
| - lower limit | 10 ms |
| - upper limit | 9,990 s |
| IEC timer | |
| • present | Yes |
| • Type | SFB |
| **Data areas and their remanence** | |
| Remanent data area, total | Total working and load memory (with backup battery) |
| Flag | |
| • Number, max. | 16 KByte |
| • Remanence available | Yes |
| • Number of clock memories | 8; (in 1 memory byte) |
| **Address area** | |
| I/O address area | |
| • Inputs | 16 KByte |
| • Outputs | 16 KByte |
| • of which, distributed | |
| - MPI/DPinterface, inputs | 2 KByte |
| - MPI/DP interface, outputs | 2 KByte |
| - DP interface, inputs | 8 KByte |
| - DP interface, outputs | 8 KByte |
| Process image | |
| • Inputs, adjustable | 16 KByte |
| • Outputs, adjustable | 16 KByte |
| • Inputs, preset | 1,024 Byte |
| • Outputs, preset | 1,024 Byte |
| • consistent data, max. | 244 Byte |
| • Access to consistent data in process image | Yes |
| Subprocess images | |
| • Number of subprocess images, max. | 15 |
| Digital channels | |
| • Inputs | 131,072 |
| • Outputs | 131,072 |
| • Inputs, of which central | 131,072 |
| • Outputs, of which central | 131,072 |
| Analog channels | |
| • Inputs | 8,192 |
| • Outputs | 8,192 |
| • Inputs, of which central | 8,192 |
| • Outputs, of which central | 8,192 |

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| **Hardware configuration** | |
| Connectable OPs | 63 |
| Central devices, max. | 1 |
| Expansion devices, max. | 21 |
| Multicomputing | Yes; Max. 4 CPUs (with UR1 or UR2) |
| IM | |
| • Number of connectable IMs (total), max. | 6 |
| • Number of connectable IM 460s, max. | 6 |
| • Number of connectable IM 463s, max. | 4; IM 463-2 |
| Number of DP masters | |
| • integrated | 2 |
| • via IM 467 | 4 |
| • via CP | 10; CP 443-5 Extended |
| • Mixed mode IM + CP permitted | No; IM 467 cannot be used with CP 443-5 Ext.; IM 467 cannot be used with CP 443-1 EX40 in PN IO mode |
| • via interface module | 2 |
| • Number of pluggable S5 modules (via adapter capsule in central device), max. | 6 |
| Number of IO controllers | |
| • via CP | 4; Via CP 443-1 EX 41 in PN mode; max. 4 in central controller |
| Number of operable FMs and CPs (recommended) | |
| • FM | Limited due to number of slots and number of connections |
| • CP, point-to-point | Limited due to number of slots and number of connections |
| • PROFIBUS and Ethernet CPs | 14; Of which 10 CP or IM max. as DP master and PN controller |
| **Time** | |
| Clock | |
| • Hardware clock (real-time clock) | Yes |
| • buffered and synchronizable | Yes |
| • Resolution | 1 ms |
| Operating hours counter | |
| • Number | 8 |
| Clock synchronization | |
| • supports | Yes |
| • to MPI, Master | Yes |
| • to MPI, Slave | Yes |
| • to DP, Master | Yes |
| • to DP, Slave | Yes |
| • in AS, Master | Yes |
| • in AS, Slave | Yes |
| • on Ethernet via NTP | Via CP |
| • to IF 964 DP | Yes |

## Technical specifications (continued)

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| **S7 message functions** | |
| Number of login stations for message functions, max. | 63; Max. 63 with ALARM_S and ALARM_D (OPs); max. 16 with ALARM_8 and ALARM_P (e.g. WinCC) |
| Symbol-related messages | Yes |
| Number of messages | |
| • overall, max. | 1,024 |
| Block related messages | Yes |
| Alarm 8-blocks | Yes |
| Instrumentation & control messages | Yes |
| **Test commissioning functions** | |
| Status/control | |
| • Status/control variable | Yes |
| Forcing | |
| • Forcing | Yes |
| Status block | Yes |
| Single step | Yes |
| Number of breakpoints | 4 |
| Diagnostic buffer | |
| • present | Yes |
| • Number of entries, max. | 3,200 |
| • adjustable | Yes |
| • preset | 120 |
| **Communication functions** | |
| PG/OP communication | Yes |
| Routing | Yes |
| Global data communication | |
| • supported | Yes |
| • Size of GD packets, max. | 54 Byte |
| S7 basic communication | |
| • supported | Yes |
| • Useful data per job, max. | 76 Byte |
| S7 communication | |
| • supported | Yes |
| • Useful data per job, max. | 64 KByte |
| S5-compatible communication | |
| • supported | Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV) |
| • Useful data per job, max. | 8 KByte |
| Standard communication (FMS) | |
| • supported | Yes; Via CP and loadable FB |
| Web server | No; Via CP |
| Open IE communication | |
| • ISO-on-TCP (RFC1006) | Via CP 443-1 Adv. and loadable FB |
| - Data length, max. | 1452 |
| Number of connections | |
| • overall | 64 |

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| **1st interface** | |
| Physics | RS 485 / PROFIBUS |
| isolated | Yes |
| Functionality | |
| • MPI | Yes |
| • DP master | Yes |
| • DP slave | Yes |
| MPI | |
| • Number of connections | 44 |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes |
| - Global data communication | Yes |
| - S7 basic communication | Yes |
| - S7 communication | Yes |
| • Transmission speeds, max. | 12 Mbit/s |
| DP master | |
| • Number of connections, max. | 32 |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes |
| - S7 basic communication | Yes |
| - S7 communication | Yes |
| - Equidistance support | Yes |
| - Activation/deactivation of DP slaves | Yes |
| - direct data exchange (cross traffic) | Yes |
| • Transmission speeds, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 32 |
| • Address area | |
| - Inputs, max. | 2 KByte |
| - Outputs, max. | 2 KByte |
| • Useful data per DP slave | |
| - Inputs, max. | 244 Byte |
| - Outputs, max. | 244 Byte |
| DP slave | |
| • Number of connections | 32 |
| • Services | |
| - Routing | Yes |
| - Status/control | Yes |
| - Programming | Yes |
| • Transmission speeds, max. | 12 Mbit/s |
| • Transfer memory | |
| - Inputs | 244 Byte |
| - Outputs | 244 Byte |
| • Address area, max. | 32 |
| • Useful data per address area, max. | 32 Byte |
| • Useful data per address area, of which consistent, max. | 32 Byte |

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## Technical specifications (continued)

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| **2nd interface** | |
| Physics | RS 485 / PROFIBUS |
| isolated | Yes |
| Functionality | |
| • DP master | Yes |
| • DP slave | Yes |
| DP master | |
| • Number of connections, max. | 32 |
| • Services | |
| - PG/OP communication | Yes |
| - Routing | Yes |
| - S7 basic communication | Yes |
| - S7 communication | Yes |
| - Equidistance support | Yes |
| - Activation/deactivation of DP slaves | Yes |
| - direct data exchange (cross traffic) | Yes |
| • Transmission speeds, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 125 |
| • Address area | |
| - Inputs, max. | 8 KByte |
| - Outputs, max. | 8 KByte |
| • Useful data per DP slave | |
| - Inputs, max. | 244 Byte |
| - Outputs, max. | 244 Byte |
| DP slave | |
| • Number of connections | 32 |
| • Services | |
| - Routing | Yes |
| - Status/control | Yes |
| - Programming | Yes |
| • Transmission speeds, max. | 12 Mbit/s |
| • Transfer memory | |
| - Inputs | 244 Byte |
| - Outputs | 244 Byte |
| • Address area, max. | 32 |
| • Useful data per address area, max. | 32 Byte |
| • Useful data per address area, of which consistent, max. | 32 Byte |
| **3rd interface** | |
| Type of interfaces | Pluggable interface module (IF), technical specifications as for 2nd interface |
| Pluggable interface module | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) |
| **4th interface** | |
| Type of interface | Pluggable interface module (IF), technical specifications as for 2nd interface |
| Pluggable interface modules | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) |

| | 6ES7 417-4XT05-0AB0 |
|---|---|
| **Isochronous mode** | |
| Useful data per isochronous slave, max. | 244 Byte |
| Equidistance | Yes |
| shortest clock pulse | 1 ms; 0.5 ms without use of SFC 126, 127 |
| **CiR configuration in RUN** | |
| CiR synchronization time, basic load | 100 ms |
| CiR synchronization time, time per I/O slave | 40 µs |
| **CPU/programming** | |
| Configuration software | |
| • STEP 7 | Yes |
| Programming language | |
| • LAD | Yes |
| • FUP | Yes |
| • AWL | Yes |
| • SCL | Yes |
| • CFC | Yes |
| • GRAPH | Yes |
| • HiGraph | Yes |
| Nesting levels | 7 |
| User program protection/password protection | Yes |
| **Dimensions** | |
| Width | 50 mm |
| Height | 290 mm |
| Depth | 219 mm |
| **Dimensions** | |
| Required slots | 2 |
| **Weights** | |
| Weight, approx. | 920 g |

| Ordering data | Order No. |
|---|---|
| **CPU 417-4** | **6ES7 417-4XT05-0AB0** |
| Main memory 30 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, module slots for up to 2 additional IF modules, slot for memory card, incl. slot number labels | |
| **Memory Card RAM** | |
| 64 KB | **6ES7 952-0AF00-0AA0** |
| 256 KB | **6ES7 952-1AH00-0AA0** |
| 1 MB | **6ES7 952-1AK00-0AA0** |
| 2 MB | **6ES7 952-1AL00-0AA0** |
| 4 MB | **6ES7 952-1AM00-0AA0** |
| 8 MB | **6ES7 952-1AP00-0AA0** |
| 16 MB | **6ES7 952-1AS00-0AA0** |
| 64 MB | **6ES7 952-1AY00-0AA0** |
| **FEPROM memory card** | |
| 64 KB | **6ES7 952-0KF00-0AA0** |
| 256 KB | **6ES7 952-0KH00-0AA0** |
| 1 MB | **6ES7 952-1KK00-0AA0** |
| 2 MB | **6ES7 952-1KL00-0AA0** |
| 4 MB | **6ES7 952-1KM00-0AA0** |
| 8 MB | **6ES7 952-1KP00-0AA0** |
| 16 MB | **6ES7 952-1KS00-0AA0** |
| 32 MB | **6ES7 952-1KT00-0AA0** |
| 64 MB | **6ES7 952-1KY00-0AA0** |
| **MPI cable** | **6ES7 901-0BF00-0AA0** |
| For connecting SIMATIC S7 and the PG through MPI; 5 m in length | |
| **IF 964-DP interface module** | **6ES7 964-2AA04-0AB0** |
| To connect an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4 | |
| **Slot number plates** | **6ES7 912-0AA00-0AA0** |
| 1 set (spare part) | |
| **Manual "SIMATIC S7-400 programmable controller"** | |
| incl. instruction list | |
| German | **6ES7 498-8AA05-8AA0** |
| English | **6ES7 498-8AA05-8BA0** |
| French | **6ES7 498-8AA05-8CA0** |
| Spanish | **6ES7 498-8AA05-8DA0** |
| Italian | **6ES7 498-8AA05-8EA0** |
| **S7-400 operation list** | |
| German | **6ES7 498-8AA05-8AN0** |
| English | **6ES7 498-8AA05-8BN0** |
| French | **6ES7 498-8AA05-8CN0** |
| Spanish | **6ES7 498-8AA05-8DN0** |
| Italian | **6ES7 498-8AA05-8EN0** |

| | Order No. |
|---|---|
| **Manual "Communication for SIMATIC S7-300/-400"** | |
| German | **6ES7 398-8EA00-8AA0** |
| English | **6ES7 398-8EA00-8BA0** |
| French | **6ES7 398-8EA00-8CA0** |
| Spanish | **6ES7 398-8EA00-8DA0** |
| Italian | **6ES7 398-8EA00-8EA0** |
| **SIMATIC Manual Collection** D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | |
| **SIMATIC Manual Collection update service for 1 year** D) | **6ES7 998-8XC01-8YE2** |
| Current "Manual Collection" DVD and the three subsequent updates | |
| **Brochure "SIMATIC S7-400 programmable controller - Design and application"** | |
| German | **6ES7 498-8AA00-8AB0** |
| English | **6ES7 498-8AA00-8BB0** |
| **RS 485 bus connector with 90° cable outlet** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA12-0XA0** |
| With PG interface | **6ES7 972-0BB12-0XA0** |
| **RS 485 bus connector with angled cable outlet** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA41-0XA0** |
| With PG interface | **6ES7 972-0BB41-0XA0** |
| **RS 485 bus connector with 90° cable outlet for Fast Connect system** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA50-0XA0** |
| With PG interface | **6ES7 972-0BB50-0XA0** |
| **RS 485 bus connector with axial cable outlet** | |
| For SIMATIC OP, for connection to PPI, MPI, PROFIBUS | **6GK1 500-0EA02** |
| **PROFIBUS FastConnect bus cable** | |
| Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m | **6XV1 830-0EH10** |

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

# CPU 416F

## Overview

- For constructing a fail-safe automation system for plants with increased safety requirements
- High-performance CPU in the top-end performance range
- Satisfies safety requirements up to SIL 3 acc. to IEC 61508 and Cat. 4 acc. to EN 954-1
- Standard and safety-related tasks can be performed with a single CPU
- Multi-processor mode is possible
- Safety-related communication with distributed I/O devices over PROFIBUS DP with the *PROFI*safe profile
- Fail-safe I/O modules can be connected decentralized over the integrated interfaces (DP and PN with CPU 416F-3 PN/DP) and/or through communication modules (CP 443-5 Ext. and CP 443-1 Adv.)
- Standard modules for non-safety-related applications can be operated centrally and decentralized

## Technical specifications

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| **Product status** | | |
| Firmware version | V 5.0 | V 5.0 |
| Associated programming package | From STEP 7 V 5.3 SP2 or higher with HW update | From STEP 7 V 5.4 SP1 or higher |
| **Voltages and currents** | | |
| Feeding of external buffer voltage to CPU | 5 to 15 V DC | 5 to 15 V DC |
| **Current consumption** | | |
| from backplane bus 5 V DC, max. | 1.1 A | 1.4 A |
| from interface 5 V DC, max. | 90 mA; At each DP interface | 90 mA; At each DP interface |
| Power loss, typ. | 4 W | 5.5 W |
| **Backup battery** | | |
| Buffer current, typ. | 125 µA; Valid up to 40 °C | 125 µA; Valid up to 40 °C |
| Buffer current, max. | 550 µA | 550 µA |
| **Memory** | | |
| Type of storage | | |
| • RAM | | |
| - integrated (for program) | 2.8 MByte | 5.6 MByte |
| - integrated (for data) | 2.8 MByte | 5.6 MByte |
| - expandable | No | No |
| • Load memory | | |
| - expandable FEPROM | Yes | Yes; With Memory Card (FLASH) |
| - expandable FEPROM, max. | 64 MByte | 64 MByte |
| - integrated RAM, max. | 1 MByte | 1 MByte |
| - expandable RAM | Yes | Yes; With Memory Card (RAM) |
| - expandable RAM, max. | 64 MByte | 64 MByte |
| Backup | | |
| • present | Yes | Yes |
| • with battery | Yes | Yes |
| • without battery | No | No |

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| **CPU/blocks** | | |
| DB | | |
| • Number, max. | 10,000; Number range: 1 to 16,000 | 10,000; Number range: 1 to 16,000 |
| • Size, max. | 64 KByte | 64 KByte |
| FB | | |
| • Number, max. | 5,000; Number range: 0 to 7,999 | 5,000; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte | 64 KByte |
| FC | | |
| • Number, max. | 5,000; Number range: 0 to 7,999 | 5,000; Number range: 0 to 7,999 |
| • Size, max. | 64 KByte | 64 KByte |
| OB | | |
| • Number, max. | See OP list | See OP list |
| • Size, max. | 64 KByte | 64 KByte |
| • Number of isochronous mode OBs | 4 | 4 |
| Nesting depth | | |
| • per priority class | 24 | 24 |
| • additional within an error OB | 2 | 2 |
| **CPU/processing times** | | |
| for bit operations, min. | 30 ns | 30 ns |
| for word operations, min. | 30 ns | 30 ns |
| for fixed point arithmetic, min. | 30 ns | 30 ns |
| for floating point arithmetic, min. | 90 ns | 90 ns |

## Technical specifications (continued)

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| **Times/counters and their remanence** | | |
| S7 counter | | |
| • Number | 2,048 | 2,048 |
| • Remanence | | |
| - adjustable | Yes | Yes |
| - lower limit | 0 | 0 |
| - upper limit | 2,047 | 2,047 |
| - preset | From Z 0 to Z 7 | From Z 0 to Z 7 |
| • Counting range | | |
| - lower limit | 0 | 0 |
| - upper limit | 999 | 999 |
| IEC counter | | |
| • present | Yes | Yes |
| • Type | SFB | SFB |
| S7 times | | |
| • Number | 2,048 | 2,048 |
| • Remanence | | |
| - adjustable | Yes | Yes |
| - lower limit | 0 | 0 |
| - upper limit | 2,047 | 2,047 |
| - preset | No timers retentive | No timers retentive |
| • Time range | | |
| - lower limit | 10 ms | 10 ms |
| - upper limit | 9,990 s | 9,990 s |
| IEC timer | | |
| • present | Yes | Yes |
| • Type | SFB | SFB |
| **Data areas and their remanence** | | |
| Remanent data area, total | Total working and load memory (with backup battery) | Total working and load memory (with backup battery) |
| Flag | | |
| • Number, max. | 16 KByte | 16 KByte; Size of bit memory address area |
| • Remanence available | Yes | Yes |
| • Number of clock memories | 8; (in 1 memory byte) | 8; (in 1 memory byte) |
| **Address area** | | |
| I/O address area | | |
| • Inputs | 16 KByte | 16 KByte |
| • Outputs | 16 KByte | 16 KByte |
| • of which, distributed | | |
| - MPI/DP interface, inputs | 2 KByte | 2 KByte |
| - MPI/DP interface, outputs | 2 KByte | 2 KByte |
| - DP interface, inputs | 8 KByte | 8 KByte |
| - DP interface, outputs | 8 KByte | 8 KByte |
| - PN interface, inputs | | 8 KByte |
| - PN interface, outputs | | 8 KByte |

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| Process image | | |
| • Inputs, adjustable | 16 KByte | 16 KByte |
| • Outputs, adjustable | 16 KByte | 16 KByte |
| • Inputs, preset | 512 Byte | 512 Byte |
| • Outputs, preset | 512 Byte | 512 Byte |
| • consistent data, max. | 244 Byte | 244 Byte |
| • Access to consistent data in process image | Yes | Yes |
| Subprocess images | | |
| • Number of subprocess images, max. | 15 | 15 |
| Digital channels | | |
| • Inputs | 131,072 | 131,072 |
| • Outputs | 131,072 | 131,072 |
| • Inputs, of which central | 131,072 | 131,072 |
| • Outputs, of which central | 131,072 | 131,072 |
| Analog channels | | |
| • Inputs | 8,192 | 8,192 |
| • Outputs | 8,192 | 8,192 |
| • Inputs, of which central | 8,192 | 8,192 |
| • Outputs, of which central | 8,192 | 8,192 |
| **Hardware configuration** | | |
| Connectable OPs | 63 | 63 |
| Central devices, max. | 1 | 1 |
| Expansion devices, max. | 21 | 21 |
| Multicomputing | Yes; 4 CPUs max. (with UR1 or UR2) | Yes; 4 CPUs max. (with UR1 or UR2) |
| IM | | |
| • Number of connectable IMs (total), max. | 6 | 6 |
| • Number of connectable IM 460s, max. | 6 | 6 |
| • Number of connectable IM 463s, max. | 4; IM 463-2 | 4; IM 463-2 |
| Number of DP masters | | |
| • integrated | 2 | 1 |
| • via IM 467 | 4 | 4 |
| • via CP | 10; CP 443-5 Ext. | 10; CP 443-5 Ext. |
| • Mixed mode IM + CP permitted | No; IM 467 not suitable for use with CP 443-5 Ext. and CP 443-1 EX4x (in PN IO mode) | No; IM 467 not suitable for use with CP 443-5 Ext. and CP 443-1 EX4x (in PN IO mode) |
| • via interface module | 0 | 1; IF 964-DP |
| • Number of pluggable S5 modules (vnia adapter capsule in central device), max. | 6 | 6 |

## CPU 416F

### Technical specifications (continued)

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| Number of IO controllers | | |
| • integrated | | 1 |
| • via CP | 4; Via CP 443-1EX41 in PN operation: max. 4 in central controller | 4; Via CP 443-1 EX41 in PN operation: max. 4 in central unit |
| Number of operable FMs and CPs (recommended) | | |
| • FM | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • CP, point-to-point | Limited due to number of slots and number of connections | Limited due to number of slots and number of connections |
| • PROFIBUS and Ethernet CPs | 14; Of which max. 10 CP o. IM as DP master and PN controller | 14; Of which 10 CP/IM max. as DP master and PN controller |
| **Time** | | |
| Clock | | |
| • Hardware clock (real-time clock) | Yes | Yes |
| • buffered and synchronizable | Yes | Yes |
| • Resolution | 1 ms | 1 ms |
| Operating hours counter | | |
| • Number | 8 | 8 |
| Clock synchronization | | |
| • supports | Yes | Yes |
| • to MPI, Master | Yes | Yes |
| • to MPI, Slave | Yes | Yes |
| • to DP, Master | Yes | Yes |
| • to DP, Slave | Yes | Yes |
| • in AS, Master | Yes | Yes |
| • in AS, Slave | Yes | Yes |
| • on Ethernet via NTP | Via CP | Yes; As client |
| • to IF 964 DP | | Yes |
| **S7 message functions** | | |
| Number of login stations for message functions, max. | 63; Max. 63 with alarm_S and alarm_D (OP's); 12 max. with alarm_8 and alarm_P (e.g. WinCC) | 63; Max. 63 with alarm_S and alarm_D (OP's); max. 12 with alarm_8 and alarm_P (e.g. WinCC) |
| Symbol-related messages | Yes | Yes |
| Number of messages | | |
| • overall, max. | 1,024 | 1,024 |
| Block related messages | Yes | Yes |
| Alarm 8-blocks | Yes | Yes |
| Instrumentation & control messages | Yes | Yes |

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| **Test commissioning functions** | | |
| Status/control | | |
| • Status/control variable | Yes | Yes |
| Forcing | | |
| • Forcing | Yes | Yes |
| Status block | Yes | Yes |
| Single step | Yes | Yes |
| Number of breakpoints | 4 | 4 |
| Diagnostic buffer | | |
| • present | Yes | Yes |
| • Number of entries, max. | 3,200 | 3,200 |
| • adjustable | Yes | Yes |
| • preset | 120 | 120 |
| **Communication functions** | | |
| PG/OP communication | Yes | Yes |
| Routing | Yes | Yes |
| Global data communication | | |
| • supported | Yes | Yes |
| • Size of GD packets, max. | 54 Byte | 54 Byte |
| S7 basic communication | | |
| • supported | Yes | Yes |
| • Useful data per job, max. | 76 Byte | 76 Byte |
| S7 communication | | |
| • supported | Yes | Yes |
| • Useful data per job, max. | 64 KByte | 64 KByte |
| S5-compatible communication | | |
| • supported | Yes; (via CP - max. 10 - and FC AG_SEND and FC AG_RECV) | Yes; (via CP - max. 10 - and FC AG_SEND and FC AG_RECV) |
| • Useful data per job, max. | 8 KByte | 8 KByte |
| Standard communication (FMS) | | |
| • supported | Yes; Via CP and loadable FB | Yes; Via CP and loadable FB |
| Web server | No; Via CP | Yes; Read-only function |
| Open IE communication | | |
| • TCP/IP | | Yes |
| - Number of connections, max. | | 64 |
| - Data length, max. | | 32 KByte |
| • ISO-on-TCP (RFC1006) | Via CP 443-1 Adv and loadable FB | Yes |
| - Number of connections, max. | | 64 |
| - Data length, max. | 1452 | 32 KByte; 1452 bytes via CP 443-1 Adv. |

## Technical specifications (continued)

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| • UDP | | Yes |
| - Number of connections, max. | | 64 |
| - Data length, max. | | 1,472 Byte |
| Number of connections | | |
| • overall | 64 | 64 |
| PROFINET CBA (at set setpoint communication load) | | |
| • Number of remote interconnection partners | | 32 |
| • Number of functions, master/slave | | 150 |
| • Total of all master/slave connections | | 6,000 |
| • Data length of all incoming connections master/slave, max. | | 65,000 Byte |
| • Data length of all outgoing connections master/slave, max. | | 65,000 Byte |
| • Number of device-internal and PROFIBUS interconnections | | 1,000 |
| • Data length of device-internal and PROFIBUS interconnections, max. | | 16,000 Byte |
| • Data length per connection, max. | | 2,000 Byte |
| • Remote interconnections with acyclic transmission | | |
| - Sampling frequency: sampling interval, min. | | 200 ms; Depending on preset communcation load, number of interconnections and data length used |
| - Number of incoming interconnections | | 500 |
| - Number of outgoing interconnections | | 500 |
| - Data length of all incoming interconnections, max. | | 16,000 Byte |
| - Data length of all outgoing interconnections, max. | | 16,000 Byte |
| - Data length per connection, max. | | 2,000 Byte |

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| • Remote interconnections with cyclic transmission | | |
| - Transmission frequency: transmission interval, min. | | 1 ms; Depending on preset communication load, number of interconnections and data length used |
| - Number of incoming interconnections | | 300 |
| - Number of outgoing interconnections | | 300 |
| - Data length of all incoming interconnections, max. | | 4,800 Byte |
| - Data length of all outgoing interconnections, max. | | 4,800 Byte |
| - Data length per connection, max. | | 250 Byte |
| • HMI variables via PROFINET (acyclic) | | |
| - Number of log-in stations for HMI variables (PN OPC/iMap) | | 2x PN OPC/1x iMap |
| - HMI variable updating | | 500 ms |
| - Number of HMI variables | | 1,500 |
| - Data length of all HMI variables, max. | | 48,000 Byte |
| • PROFIBUS proxy functionality | | |
| - supported | | Yes; 32 PROFIBUS slaves max. connectable |
| - Data length per connection, max. | | 240 Byte; Slave-dependent |
| **1st interface** | | |
| Physics | RS 485 / PROFIBUS | RS 485 / PROFIBUS + MPI |
| isolated | Yes | Yes |
| Functionality | | |
| • MPI | Yes | Yes |
| • DP master | Yes | Yes |
| • DP slave | Yes | Yes |
| MPI | | |
| • Number of connections | 44 | 44 |
| • Services | | |
| - PG/OP communication | Yes | Yes |
| - Routing | Yes | Yes |
| - Global data communication | Yes | Yes |
| - S7 basic communication | Yes | Yes |
| - S7 communication | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s |

## CPU 416F

### Technical specifications (continued)

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| DP master | | |
| • Number of connections, max. | 32 | 32; If a diagnostic repeater is used on the line, the number of connection resources on the line is reduced by 1 |
| • Services | | |
| - PG/OP communication | Yes | Yes |
| - Routing | Yes | Yes |
| - S7 basic communication | Yes | Yes |
| - S7 communication | Yes | Yes |
| - Equidistance support | Yes | Yes |
| - Activation/deactivation of DP slaves | Yes | Yes |
| - direct data exchange (cross traffic) | Yes | Yes |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s |
| • Number of DP slaves, max. | 32 | 32 |
| • Address area | | |
| - Inputs, max. | 2 KByte | 2 KByte |
| - Outputs, max. | 2 KByte | 2 KByte |
| • Useful data per DP slave | | |
| - Inputs, max. | 244 Byte | 244 Byte |
| - Outputs, max. | 244 Byte | 244 Byte |
| DP slave | | |
| • Number of connections | 32 | 32 |
| • Services | | |
| - Routing | Yes | Yes; When interface active |
| - Status/control | Yes | Yes; When interface active |
| - Programming | Yes | Yes; When interface active |
| • Transmission speeds, max. | 12 Mbit/s | 12 Mbit/s |
| • Transfer memory | | |
| - Inputs | 244 Byte | 244 Byte |
| - Outputs | 244 Byte | 244 Byte |
| • Address area, max. | 32 | 32; Virtual slots |
| • Useful data per address area, max. | 32 Byte | 32 Byte |
| • Useful data per address area, of which consistent, max. | 32 Byte | 32 Byte |
| **2nd interface** | | |
| Physics | RS 485 / PROFIBUS | Ethernet |
| isolated | Yes | Yes |

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| DP-Master | | |
| Functionality | | |
| • DP master | Yes | No |
| • DP slave | Yes | No |
| • PROFINET IO controller | | Yes |
| • PROFINET CBA | | Yes |
| • Point-to-point coupling | | No |
| DP master | | |
| • Number of connections, max. | 32 | |
| • Services | | |
| - PG/OP communication | Yes | |
| - Routing | Yes | |
| - S7 basic communication | Yes | |
| - S7 communication | Yes | |
| - Equidistance support | Yes | |
| - Activation/deactivation of DP slaves | Yes | |
| - direct data exchange (cross traffic) | Yes | |
| • Transmission speeds, max. | 12 Mbit/s | |
| • Number of DP slaves, max. | 125 | |
| • Address area | | |
| - Inputs, max. | 8 KByte | |
| - Outputs, max. | 8 KByte | |
| • Useful data per DP slave | | |
| - Inputs, max. | 244 Byte | |
| - Outputs, max. | 244 Byte | |
| DP slave | | |
| • Number of connections | 32 | |
| • Services | | |
| - Routing | Yes | |
| - Status/control | Yes | |
| - Programming | Yes | |
| • Transmission speeds, max. | 12 Mbit/s | |
| • Transfer memory | | |
| - Inputs | 244 Byte | |
| - Outputs | 244 Byte | |
| • Address area, max. | 32 | |
| • Useful data per address area, max. | 32 Byte | |
| • Useful data per address area, of which consistent, max. | 32 Byte | |
| PROFINET CBA | | |
| • Acyclic transmission | | Yes |
| • Cyclic transmission | | Yes |

## Technical specifications (continued)

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| PROFINET IO controller | | |
| • Services | | |
| - PG/OP communication | | Yes |
| - Routing | | Yes; Routing of PG functions |
| - S7 communication | | Yes |
| - open IE communication | | Yes |
| • Transmission rate, min. | | 10 Mbit/s |
| • Transmission speed, max. | | 100 Mbit/s |
| • Number of connectable IO-devices, max. | | 256 |
| • Updating time | | 250 µs to 512 ms; minimum value dependent on preset communication share for PROFINET I/O, of number of I/O devices and number of configured user data |
| • Address area | | |
| - Inputs, max. | | 8 KByte |
| - Outputs, max. | | 8 KByte |
| • Useful data consistency, max. | | 255 Byte; Including user data attendant |
| **3rd interface** | | |
| Type of interfaces | | Pluggable interface module (IF), technical specifications as for 2nd interface |
| pluggable interface module | | IF 964-DP (Order No.: 6ES7 964-2AA04-0AB0) |
| Physics | | RS 485/PROFIBUS |
| isolated | | Yes |
| Power supply to interface (15 to 30 V DC), max. | | 150 mA |
| Number of connection resources | | 32 |
| Functionality | | |
| • MPI | | No |
| • DP slave | | Yes |
| • DP master | | Yes |
| DP master | | |
| • Number of connections, max. | | 32 |
| • Services | | |
| - PG/OP communication | | Yes |
| - Routing | | Yes |
| - Global data communication | | No |
| - S7 basic communication | | Yes |
| - S7 communication | | Yes |
| - Equidistance support | | Yes |
| - SYNC/FREEZE | | Yes |
| - Activation/deactivation of DP slaves | | Yes |
| - Direct data exchange | | Yes |
| • Transmission rate, max. | | 12 Mbit/s |
| • Number of DP slaves, max. | | 125 |
| • Address area | | |
| - Inputs, max. | | 8 KByte |
| - Outputs, max. | | 8 KByte |
| • Useful data per DP slave | | |
| - Useful data per DP slave, max. | | 244 Byte |
| - Inputs, max. | | 244 Byte |
| - Outputs, max. | | 244 Byte |
| - Slots, max. | | 244 |
| - per slot, max. | | 128 Byte |
| DP slave | | |
| • Number of connections | | 32 |
| • Services | | |
| - Routing | | Yes; When interface active |
| - Programming | | Yes; When interface active |
| - Status/control | | Yes; When interface active |
| • GSD file | | http://support.automation.siemens.com/WW/view/de/113652 |
| • Transmission rate, max. | | 12 Mbit/s |
| • Transfer memory | | |
| - Inputs | | 244 Byte |
| - Outputs | | 244 Byte |
| • Address range, max. | | 32 |
| • Useful data per address area, max. | | 32 Byte |
| • Useful data per address area, of which consistent, max. | | 32 Byte |

## CPU 416F

### Technical specifications (continued)

| | 6ES7 416-2FN05-0AB0 | 6ES7 416-3FR05-0AB0 |
|---|---|---|
| **Isochronous mode** | | |
| Useful data per isochronous slave, max. | 244 Byte | 244 Byte |
| Equidistance | Yes | Yes |
| shortest clock pulse | 1 ms; 0.5 ms without use of SFC 126, 127 | 1 ms; Without use of SFC 126 and 127 up to 0.5 ms |
| **CiR configuration in RUN** | | |
| CiR synchronization time, basic load | 100 ms | 100 ms |
| CiR synchronization time, time per I/O slave | 40 µs | 40 µs |
| **CPU/programming** | | |
| Configuration software | | |
| • STEP 7 | Yes | Yes |
| Programming language | | |
| • STEP 7 | | Yes |
| • LAD | Yes | Yes |
| • FUP | Yes | Yes |
| • AWL | Yes | Yes |
| • SCL | Yes | Yes |
| • CFC | Yes | Yes |
| • GRAPH | Yes | Yes |
| • HiGraph | Yes | Yes |
| Nesting levels | 7 | 7 |
| User program protection/password protection | Yes | Yes |
| **Dimensions** | | |
| Width | 25 mm | 50 mm |
| Height | 290 mm | 290 mm |
| Depth | 219 mm | 219 mm |
| **Dimensions** | | |
| Required slots | 1 | 2 |
| **Weights** | | |
| Weight, approx. | 720 g | 900 g |

| Ordering data | | Order No. |
|---|---|---|
| **CPU 416F-2** | A) | **6ES7 416-2FN05-0AB0** |
| For configuring safety-related automation systems; main memory 5.6 MB, 24 V DC power supply, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels | | |
| **CPU 416F-3 PN/DP** | A) | **6ES7 416-3FR05-0AB0** |
| For configuring safety-related automation systems; main memory 11.2 MB, 24 V DC power supply, MPI/PROFIBUS DP master interface, PROFINET interface, PROFIBUS DP master interface, receptacle for 1 IF submodule, slot for memory card, incl. slot number labels | | |
| **Option package S7 F Distributed Safety V5.4** | | |
| Task: Software for configuring fail S7-300F, S7-400F, ET 200S | | |
| Requirement: STEP 7 V5.3 SP3 and higher | | |
| Floating license | | **6ES7 833-1FC02-0YA5** |
| Upgrade from V5.x to V5.4 | | **6ES7 833-1FC02-0YE5** |
| Software Update Service | | **6ES7 833-1FC00-0YX2** |
| **RAM memory card** | | |
| 64 KB | | **6ES7 952-0AF00-0AA0** |
| 256 KB | | **6ES7 952-1AH00-0AA0** |
| 1 MB | | **6ES7 952-1AK00-0AA0** |
| 2 MB | | **6ES7 952-1AL00-0AA0** |
| 4 MB | | **6ES7 952-1AM00-0AA0** |
| 8 MB | | **6ES7 952-1AP00-0AA0** |
| 16 MB | | **6ES7 952-1AS00-0AA0** |
| 64 MB | | **6ES7 952-1AY00-0AA0** |
| **FEPROM memory card** | | |
| 64 KB | | **6ES7 952-0KF00-0AA0** |
| 256 KB | | **6ES7952-0KH00-0AA0** |
| 1 MB | | **6ES7 952-1KK00-0AA0** |
| 2 MB | | **6ES7 952-1KL00-0AA0** |
| 4 MB | | **6ES7 952-1KM00-0AA0** |
| 8 MB | | **6ES7 952-1KP00-0AA0** |
| 16 MB | | **6ES7 952-1KS00-0AA0** |
| 32 MB | | **6ES7 952-1KT00-0AA0** |
| 64 MB | | **6ES7 952-1KY00-0AA0** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

| | | Order No. |
|---|---|---|
| **MPI cable** | | **6ES7 901-0BF00-0AA0** |
| For connecting SIMATIC S7 and the PG through MPI; 5 m in length | | |
| **IF 964-DP interface module** | | **6ES7 964-2AA04-0AB0** |
| For connecting an additional DP line | | |
| **Slot number plates** | | **6ES7 912-0AA00-0AA0** |
| 1 set (spare part) | | |
| **Manual "SIMATIC S7-400 programmable controller"** | | |
| incl. instruction list | | |
| German | | **6ES7 498-8AA05-8AA0** |
| English | | **6ES7 498-8AA05-8BA0** |
| French | | **6ES7 498-8AA05-8CA0** |
| Spanish | | **6ES7 498-8AA05-8DA0** |
| Italian | | **6ES7 498-8AA05-8EA0** |
| **S7-400 operation list** | | |
| German | | **6ES7 498-8AA05-8AN0** |
| English | | **6ES7 498-8AA05-8BN0** |
| French | | **6ES7 498-8AA05-8CN0** |
| Spanish | | **6ES7 498-8AA05-8DN0** |
| Italian | | **6ES7 498-8AA05-8EN0** |
| **Manual "Communication for SIMATIC S7-300/-400"** | | |
| German | | **6ES7 398-8EA00-8AA0** |
| English | | **6ES7 398-8EA00-8BA0** |
| French | | **6ES7 398-8EA00-8CA0** |
| Spanish | | **6ES7 398-8EA00-8DA0** |
| Italian | | **6ES7 398-8EA00-8EA0** |
| **SIMATIC Manual Collection** | D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | | |
| **SIMATIC Manual Collection update service for 1 year** | D) | **6ES7 998-8XC01-8YE2** |
| Current "Manual Collection" DVD and the three subsequent updates | | |
| **Brochure "SIMATIC S7-400 programmable controller - Design and application"** | | |
| German | | **6ES7 498-8AA00-8AB0** |
| English | | **6ES7 498-8AA00-8BB0** |

## CPU 416F



| Ordering data | Order No. |
|---|---|
| ***PROFIBUS bus components*** | |
| **RS 485 bus connector with 90° cable outlet** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA12-0XA0** |
| With PG interface | **6ES7 972-0BB12-0XA0** |
| **RS 485 bus connector with angled cable outlet** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA41-0XA0** |
| With PG interface | **6ES7 972-0BB41-0XA0** |
| **RS 485 bus connector with 90° cable outlet for Fast Connect system** | |
| Max. transmission rate 12 Mbit/s | |
| Without PG interface | **6ES7 972-0BA50-0XA0** |
| With PG interface | **6ES7 972-0BB50-0XA0** |
| **RS 485 bus connector with axial cable outlet** | |
| For SIMATIC OP, for connection to PPI, MPI, PROFIBUS | **6GK1 500-0EA02** |
| **PROFIBUS FastConnect bus cable** | |
| Standard type with special design for quick mounting, 2-core, shielded, sold by the meter, max. delivery unit 1000 m, minimum ordering quantity 20 m | **6XV1 830-0EH10** |
| **RS 485 repeater for PROFIBUS** | **6ES7 972-0AA01-0XA0** |
| Data transfer rate up to 12 Mbit/s; 24 V DC; IP 20 housing | |

| | Order No. |
|---|---|
| ***PROFINET bus components*** | |
| **IE FC TP standard cable GP 2x2** | **6XV1 840-2AH10** |
| 4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; | |
| Sold by the meter | |
| **FO Standard Cable GP (50/125)** | **6XV1 873-2A** |
| Standard cable, splittable, UL approval, sold by the meter | |
| **SCALANCE X204-2 Industrial Ethernet switch** | **6GK5 204-2BB00-2AA3** |
| Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports | |
| **IE FC RJ45 plugs** | |
| RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables | |
| **IE FC RJ45 plug 180** | |
| 180° cable outlet | |
| 1 unit | **6GK1 901-1BB10-2AA0** |
| 10 units | **6GK1 901-1BB10-2AB0** |
| 50 units | **6GK1 901-1BB10-2AE0** |
| **PROFIBUS/PROFINET bus components** | See Catalogs IK PI, CA 01 |
| For establishing MPI/PROFIBUS/PROFINET communication | |

## Overview SIPLUS CPU 416-3, SIPLUS CPU 416-3 PN/DP

High-performance CPUs in the high-end performance range

- Applicable for plants with high requirements in the high-end performance range
- Integrated PROFINET functions in CPU 416-3 PN/DP

| | SIPLUS CPU 416-3 | SIPLUS CPU 416-3 PN/DP |
|---|---|---|
| **Order No.** | **6AG1 416-3XR05-4AB0** | **6AG1 416-3ER05-4AB0** |
| **Order No. based on** | **6ES7 416-3XR05-0AB0** | **6ES7 416-3ER05-0AB0** |
| Environmental conditions | Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere). | |
| Technical data | The technical data are identical with those of the based-on modules. | |

## Overview SIPLUS CPU 417-4

The most powerful SIMATIC S7-400 CPU

- Applicable for plants with maximum requirements in the high-end performance range
- With 2 plug-in slots for IF modules

| | SIPLUS CPU 417-4 |
|---|---|
| **Order No.** | **6AG1 417-4XT05-4AB0** |
| **Order No. based on** | **6ES7 417-4XT05-0AB0** |
| Environmental conditions | Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere) |
| Technical data | The technical data are identical with those of the based-on modules. |

## Ordering data

| | | Order No. |
|---|---|---|
| **CPU 416-3** | A) | **6AG1 416-3XR05-4AB0** |
| (medial exposure)<br>Main memory 11.2 MB, power supply 24 VDC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, module slot for 1 IF submodule, slot for memory card, incl. slot number labels | | |
| **CPU 416-3 PN/DP** | A) | **6AG1 416-3ER05-4AB0** |
| (medial exposure)<br>Main memory 11.2 MB, power supply 24 VDC, MPI/PROFIBUS DP master interface, PROFINET interface, PROFIBUS DP master interface, module slot for 1 IF submodule, slot for memory card, incl. slot number labels | | |

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

| | | Order No. |
|---|---|---|
| **SIPLUS CPU 417-4** | A) | **6AG1 417-4XT05-4AB0** |
| (medial exposure)<br>Main memory 30 MB, power supply 24 VDC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, module slots for up to 2 additional IF modules, slot for memory card, incl. slot number labels | | |
| **Accessories** | | see S7-400 CPUs, catalog ST 70 · 2007, pages 5/28, 5/34 |

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

## SIPLUS CPU 414-4H, CPU 417-4H



### Overview CPU 414-4H

CPU for SIMATIC S7-400H and S7-400F/FH

- For use in S7-400H fault-tolerant systems
- Can be used with F-Runtime license as fail-safe CPU in safety-related S7-400F/FH systems
- With integral PROFIBUS DP master interface
- With 2 plug-in slots for sync modules

| | SIPLUS CPU 414-4H |
|---|---|
| **Order No.** | **6AG1 414-4HJ04-4AB0** |
| **Order No. based on** | **6ES7 414-4HJ04-0AB0** |
| Environmental conditions | Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere) |
| Technical data | The technical data are identical with those of the based-on modules. |

### Overview CPU 417-4H

CPU for SIMATIC S7-400H and S7-400F/FH

- For use in S7-400H fault-tolerant systems
- Can be used with F-Runtime license as fail-safe CPU in safety-related S7-400F/FH systems
- With integral PROFIBUS DP master interface
- With 2 plug-in slots for sync modules

| | SIPLUS CPU 417-4H |
|---|---|
| **Order No.** | **6AG1 417-4HL04-4AB0** |
| **Order No. based on** | **6ES7 417-4HL04-0AB0** |
| Environmental conditions | Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere) |
| Technical data | The technical data are identical with those of the based-on modules. |

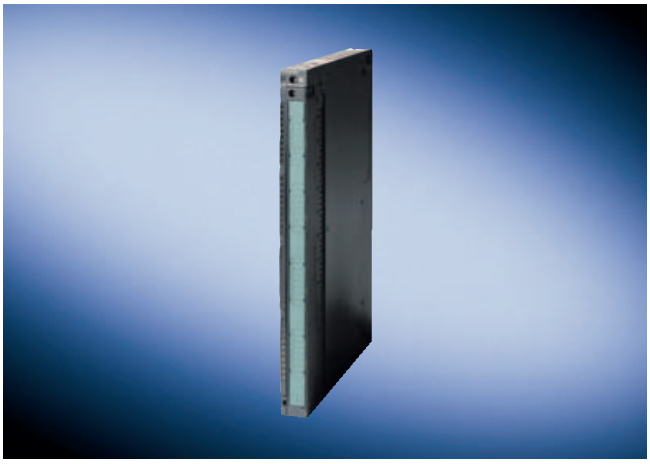
### Ordering data

| | Order No. |
|---|---|
| **SIPLUS CPU 414-4H**<br>(medial exposure)<br>For S7-400H and S7-400F/FH; MPI/PROFIBUS DP master interface, 2 slots for Sync modules, slot for memory card, incl. slot number labels<br>Main memory 1.4 MB | **6AG1 414-4HJ04-4AB0** |
| **SIPLUS CPU 417-4H**<br>(medial exposure)<br>For S7-400H and S7-400F/FH; MPI/PROFIBUS DP master interface, 2 slots for Sync modules, slot for memory card, incl. slot number labels<br>Main memory 20 MB | **6AG1 417-4HL04-4AB0** |

| | Order No. |
|---|---|
| **Accessories** | see S7-400 CPUs, catalog ST 70 · 2007, page 5/38 |

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

## Overview SIPLUS SM 421



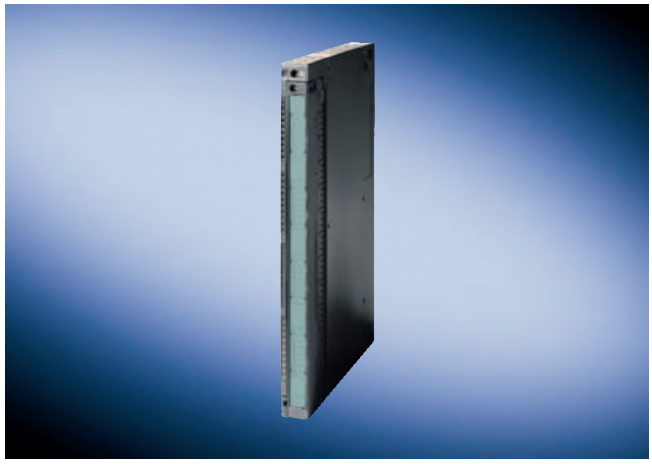
- Digital inputs for SIMATIC S7-400
- For connection of switches and 2-wire proximity switches (BEROs)

| Digital input module SIPLUS SM 421 | |
|---|---|
| **Order No.** | **6AG1 421-1BL01-2AA0** |
| **Order No. based on** | **6ES7 421-1BL01-0AA0** |
| Ambient temperature range | -25 ... +60 °C |
| Environmental conditions | Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere). |
| Technical data | The technical data are identical with those of the based-on modules. |

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

| Ordering data | Order No. |
|---|---|
| **SIPLUS SM 421 digital input module** | |
| (extended temperature range and medial exposure) | |
| 32 inputs, 24 V DC | **6AG1 421-1BL01-2AA0** |
| **Accessories** | see S7-400 digital modules, catalog ST 70 · 2007, page 5/48 |

## Overview SIPLUS SM 422



- Digital outputs for SIMATIC S7-400
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

| Digital output module SIPLUS SM 422 | |
|---|---|
| **Order No.** | **6AG1 422-1BL00-2AA0** |
| **Order No. based on** | **6ES7 422-1BL00-0AA0** |
| Ambient temperature range | -25 ... +60 °C |
| Environmental conditions | Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere). |
| Technical data | The technical data are identical with those of the based-on modules. |

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

| Ordering data | Order No. |
|---|---|
| **SIPLUS SM 422 digital output module** | |
| (extended temperature range and medial exposure) | |
| 32 outputs, 24 VDC; 0.5 A | **6AG1 422-1BL00-2AA0** |
| **Accessories** | see S7-400 digital modules, catalog ST 70 · 2007, page 5/51 |

For further technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-techdoku

# CP 443-1

## Overview

| PN | ISO | TCP/IP | UDP | PG | S7 | S5 | IT | FTP |
|---|---|---|---|---|---|---|---|---|
| ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |

- Connection of SIMATIC S7-400 to Industrial Ethernet:
  - 2 x RJ45 interface for 10/100 Mbit/s full/half duplex connection with autosensing/autonegotiation and autocrossover function
  - integrated real-time switch ERTEC with two ports
  - multi-protocol operation for ISO, TCP/IP, UDP and PROFINET IO protocols
  - adjustable Keep Alive function
- Communication services:
  - open IE communication (ISO, TCP/IP and UDP)
  - PROFINET IO Controller
  - PG/OP communication: Across networks by means of S7 routing
  - S7 communication
  - S5 compatible communication
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection by means of configurable access list
- Remote programming and initial startup via the network
- Support for fail-safe programmable controllers in combination with SIMATIC S7-400 CPU 416F-3PN/DP
- Diagnostic possibilities in STEP 7 and with web browser

## Technical specifications

| | |
|---|---|
| Data transmission rate | 10/100 Mbit/s autosensing |
| Interfaces | |
| • Communication connection, electrical | 1 x 15-pin Sub-D socket (10 Mbit/s AUI; 10/100 Mbit/s ITP)<br>1 x RJ45 (10/100 Mbit/s; TP) |
| Current consumption | |
| • from +5 V DC (±5%) | approx. 1.4 A |
| • from 24 V DC (±5%) | typ. 220 mA, max. 350 mA (depending on the interface used) |
| Power loss | 8,6 W |
| Permissible ambient conditions | |
| • Operating temperature | 0 °C … +60 °C |
| • Transport/storage temperature | -40 °C … +70 °C |
| • Relative humidity | max. 95% at +25 °C |
| Construction | |
| • Module format | Compact module S7-400, single width |
| • Dimensions (W x H x D) in mm | 25 x 290 x 210 |
| • Weight | approx. 700 g |
| Configuring software | NCM S7 for Industrial Ethernet (included in the scope of delivery of STEP 7 V5.x). |
| **Performance data** | |
| Open IE/S5-compatible communication (SEND/RECEIVE) | |
| • Sum of all simultaneously operable ISO/TCP/UDP connections | max. 64 |
| • Volume of user data ISO or TCP/IP | max. 8 KB |
| • Volume of user data UDP | max. 2 KB |
| • Amount of useful data via ISO on TCP and loadable function blocks | 1452 byte[3] |
| S7 communication | |
| • Number of connections [1] | max. 128 [2] |
| PG/OP communication | |
| • Number of PG connections | max. 2 |
| • Number of OP connections | max. 30 |
| Multi-protocol operation | |
| • Sum of all simultaneously operable connections | max. 128 |
| PROFINET communication | |
| PROFINET IO Controller | |
| • Number of operable PN IO-Devices | max. 128 |
| • Number of external IO-lines in one central rack | max. 4 |
| • Size of IO data areas overall | |
| - I/O input area | max. 4 KB |
| - I/O output area | max. 4 KB |
| • Size of I/O data areas per connected PN IO device: | |
| - I/O input area | max. 240 byte |
| - I/O output area | max. 240 byte |

[1] Utilization depends on the performance of the S7-CPU/FM used
[2] More CPUs
[3] Occupies one S7 connection each

## Ordering data

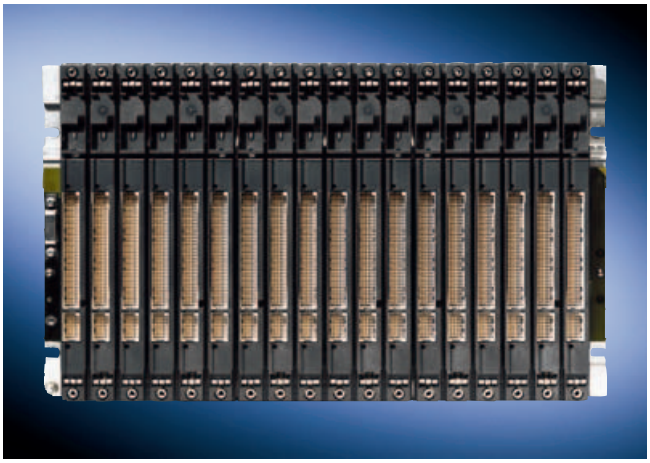
| | Order No. |
|---|---|
| **CP 443-1 communications processor** H)<br>For connecting SIMATIC S7-400 to Industrial Ethernet through TCP/IP, ISO and UDP; PROFINET IO controller, integrated real-time switch ERTEC with two ports; 2 x RJ45 interface; S7 communication, S5-compatible communication (SEND/RECEIVE) with FETCH/WRITE, with and without RFC 1006, DHCP, SNMP V2, diagnostics, multicast, access protection over IP access list, initialization over LAN 10/100 Mbit/s with electronic manual on DVD | **6GK7 443-1EX20-0XE0** |
| **IE FC TP Standard Cable GP 2x2**<br>4-core, shielded TP installation cable for connection to IE FC Outlet RJ45/ IE FC RJ45 Plug; PROFINET-compatible; with UL approval; sold by the meter | **6XV1 840-2AH10** |
| **FO Standard Cable GP (50/125)**<br>Standard cable, splittable, UL approval, sold by the meter | **6XV1 873-2A** |
| **SCALANCE X204-2 Industrial Ethernet switch**<br>Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbit/s RJ45 ports and two FO ports | **6GK5 204-2BB00-2AA3** |
| **IE FC RJ45 Plug 180**<br>RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface | |
| • 1 pack = 1 unit | **6GK1 901-1BB10-2AA0** |
| • 1 pack = 10 units | **6GK1 901-1BB10-2AB0** |
| • 1 pack = 50 units | **6GK1 901-1BB10-2AE0** |

| | Order No. |
|---|---|
| **SOFTNET-S7 Edition 2006 for Industrial Ethernet**<br>Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 64 connections, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/ Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1CW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1CW00-3AL0** |
| • Upgrade from V6.0 and higher to Edition 2006 | **6GK1 704-1CW64-3AE0** |
| **SOFTNET-S7 Lean Edition 2006 for Industrial Ethernet**<br>Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 8 connections, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/ Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1LW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1LW00-3AL0** |
| **S7-1613 Edition 2006**<br>Software for S7 and S5 communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, Windows 2000 Professional/ Server; for CP 1613/CP 1613 A2 German/English | **6GK1 716-1CB64-3AA0** |
| **NCM S7 configuration software for Industrial Ethernet**<br>Configuration software for Industrial Ethernet-CPs for SIMATIC S7; V5.x, operating under STEP 7 V5.4 SP3; on CD-ROM with electronic manual in German, English, French, Spanish, Italian | Included in the STEP 7 V5.4 SP3 package |
| **Documentation S7-CPs/NCM S7**<br>For Industrial Ethernet and PROFIBUS; manual package for configuring S7-CPs, IE/PB link and PC stations (STEP 7 V5.3) | |
| • German | **6GK7 080-0AA01-8AA0** |
| • English | **6GK7 080-0AA01-8BA0** |

H) Subject to export regulations: AL: N and ECCN: 5A991

## Racks

### Overview



- The basic mechanical framework of the SIMATIC S7-400/ S7-400H
- For accommodating the modules, supplying them with operating voltage and connecting them via the backplane bus
- Several versions for configuring central controllers and expansion racks

***UR1 (Universal Rack)***

- For setting up central controllers and expansion units.
- For holding up to 18 modules.
- Also suitable for S7-400H.
- Also available as aluminum rack.

***UR2 (Universal Rack)***

- For setting up central controllers and expansion units.
- For holding up to 9 modules.
- Also suitable for S7-400H.
- Also available as aluminum rack.

***CR2 (Central Rack)***

- For setting up central controllers.
- For holding up to 18 modules.
- Segmented rack:
  For operating two mutually independent S7-400 CPUs without S7-400 Multicomputing, but with communication between the CPUs over the backplane bus (C bus). Both CPUs can address their own local I/O modules (segmented P bus).

***CR3 (Central Rack)***

- For configuring central racks.
- Optimized for distributed automation solutions due to holding up to 4 modules.

***UR2-H***

- For configuring a complete S7-400H system in one subrack.
- Also suitable for S7-400:
  Operation of 2 separate CPUs with their own I/O (separate P and C buses).
- Can also be used as an expansion unit.
- For holding up to 18 modules.
- Also available as aluminum rack.

***ER1 (Extension Rack)***

- For setting up expansion units economically.
- For holding up to 18 modules with restricted functionality.
- Also suitable for S7-400H.
- Also available as aluminum rack.

***ER2 (Extension Rack)***

- For setting up expansion units economically.
- For holding up to 9 modules with restricted functionality.
- Also suitable for S7-400H.
- Also available as aluminum rack.

### Technical specifications

| | 6ES7 400-1TA01-0AA0 | 6ES7 400-1TA11-0AA0 | 6ES7 400-1JA01-0AA0 | 6ES7 400-1JA11-0AA0 | 6ES7 401-2TA01-0AA0 | 6ES7 401-1DA01-0AA0 |
|---|---|---|---|---|---|---|
| **Hardware configuration** | | | | | | |
| Number of single-width slots, max. | 18 | 18 | 9 | 9 | 18; 2 segments with 8 or 10 slots | 4 |
| Rack | | | | | | |
| • K bus | Yes | Yes | Yes | Yes | Yes | Yes |
| • P bus | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dimensions** | | | | | | |
| Width | 482.5 mm | 482.5 mm | 257.5 mm | 257.5 mm | 482.5 mm | 130 mm |
| Height | 290 mm | 290 mm | 290 mm | 290 mm | 290 mm | 290 mm |
| Depth | 27.5 mm | 27.5 mm | 27.5 mm | 27.5 mm | 27.5 mm | 27.5 mm |
| **Weights** | | | | | | |
| Weight, approx. | 4,200 g | 3,000 g | 2,200 g | 1,500 g | 4,200 g | 750 g |

## Technical specifications (continued)

| | 6ES7 400-2JA00-0AA0 | 6ES7 400-2JA10-0AA0 | 6ES7 403-1TA01-0AA0 | 6ES7 403-1TA11-0AA0 | 6ES7 403-1JA01-0AA0 | 6ES7 403-1JA11-0AA0 |
|---|---|---|---|---|---|---|
| **Hardware configuration** | | | | | | |
| Number of single-width slots, max. | 18 | 18 | 18 | 18 | 9 | 9 |
| Rack | | | | | | |
| • K bus | Yes | Yes | | | | |
| • P bus | Yes | Yes | Yes | Yes | Yes | Yes |
| **Dimensions** | | | | | | |
| Width | 482.5 mm | 482.5 mm | 482.5 mm | 482.5 mm | 257.5 mm | 257.5 mm |
| Height | 290 mm | 290 mm | 290 mm | 290 mm | 290 mm | 290 mm |
| Depth | 27.5 mm | 27.5 mm | 27.5 mm | 27.5 mm | 27.5 mm | 27.5 mm |
| **Weights** | | | | | | |
| Weight, approx. | 4,200 g | 3,000 g | 4,200 g | 2,500 g | 2,200 g | 1,250 g |

## Ordering data

| | | Order No. |
|---|---|---|
| **UR1 rack**<br>for central controllers and expansion units, 18 slots | | **6ES7 400-1TA01-0AA0** |
| **UR1 aluminum rack**<br>for central controllers and expansion units, 18 slots | A) | **6ES7 400-1TA11-0AA0** |
| **UR2 rack**<br>for central controllers and expansion units, 9 slots | | **6ES7 400-1JA01-0AA0** |
| **UR2 aluminum rack**<br>for central controllers and expansion units, 9 slots | | **6ES7 400-1JA11-0AA0** |
| **CR2 rack**<br>for segmented central controllers, 18 slots, 2 local segments | | **6ES7 401-2TA01-0AA0** |
| **CR3 rack**<br>for central controllers and expansion units, 4 slots; optimized for distributed automation solutions | | **6ES7 401-1DA01-0AA0** |
| **UR2-H rack**<br>for split CCs, 18 slots | | **6ES7 400-2JA00-0AA0** |
| **UR2-H aluminum rack**<br>for split CCs, 18 slots | | **6ES7 400-2JA10-0AA0** |
| **ER1 rack**<br>for expansion units, P bus only, 18 slots | | **6ES7 403-1TA01-0AA0** |
| **ER1 aluminum rack**<br>for expansion units, P bus only, 18 slots | A) | **6ES7 403-1TA11-0AA0** |
| **ER2 rack**<br>for expansion units, P bus only, 9 slots | | **6ES7 403-1JA01-0AA0** |
| **ER2 aluminum rack**<br>for expansion units, P bus only, 9 slots | A) | **6ES7 403-1JA11-0AA0** |
| **Slot cover**<br>10 units (spare part) | | **6ES7 490-1AA00-0AA0** |

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

# PS 405/407 power supply

## Overview

- Power supplies for SIMATIC S7-400
- For conversion of AC or DC line voltages to the 5 V DC and 24 V DC operating voltages required
- 4 A, 10 A and 20 A output currents
- In addition:
  - SIPLUS power supply 6AG1 405-0KA02-2AA0 for temperature range of -25 to +60 °C and use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7 405-0KA02-0AA0
  - SIPLUS power supply 6AG1 407-0KA02-4AA0 for use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7 407-0KA02-0AA0
  - SIPLUS power supply 6AG1 407-0KR02-4AA0 for use under medium load (e.g. chlorine/sulfur atmosphere). Technical specifications similar to 6ES7 407-0KR02-0AA0

## Technical specifications

| | 6AG1 405-0KA02-2AA0 | 6ES7 405-0RA02-0AA0 |
|---|---|---|
| **Power supply** | | |
| Input voltage | | |
| • Rated value, 24 V DC | Yes | Yes |
| • Rated value, 48 V DC | Yes | Yes |
| • Rated value, 60 V DC | Yes | Yes |
| • permissible range, lower limit (DC) | static 19.2 V, dynamic 18.5 V | static 19.2 V, dynamic 18.5 V |
| • permissible range, upper limit (DC) | static 72 V, dynamic 75,5 V | static: 72 V dynamic 75.5 V |
| Input current | | |
| • Rated value at 24 V DC | 4 A | 7 A |
| • Rated value at 48 V DC | 2 A | 3.2 A |
| • Rated value at 60 V DC | 1.6 A | 2.5 A |
| • Inrush current, max. | 18 A; Full width at half maximum 20 ms | 56 A; Full width at half maximum 1.5 ms |
| Output voltage | | |
| • Rated value, 5 V DC | Yes | Yes |
| • Rated value, 24 V DC | Yes | Yes |
| Output current | | |
| • for backplane bus (5 V DC), max. | 10 A; 200 mA base load required | 20 A; no base load required |
| • for backplane bus (24 V DC), max. | 1 A; idling-proof | 1 A; idling-proof |
| • Short-circuit protection | Yes | Yes |
| **Supply voltages** | | |
| Power supply and voltage jumpering | | |
| • Mains/voltage failure jumpering | 20 ms | 20 ms |
| • Mains/power failure jumper to NAMUR recommendation | Yes | Yes |

| | 6AG1 405-0KA02-2AA0 | 6ES7 405-0RA02-0AA0 |
|---|---|---|
| **Voltages and currents** | | |
| Power consumption | | |
| • Power consumption, typ. | 95 W | 168 W |
| **Current consumption** | | |
| Power loss, typ. | 20 W | 44 W |
| **Backup battery** | | |
| • Backup battery (optional) | Yes; 2 x lithium AA; 3.6 V/1.9 Ah | Yes; 2 x lithium AA; 3.6 V/2.3 Ah |
| **Connection point** | | |
| Connecting cables/cross sections | 3x 1.5 $mm^2$, solid or stranded wire with end sleeve, external diameter 3 to 9 mm | 3 x 1.5 $mm^2$, solid or stranded wire with end sleeve, external diameter 3 to 9 mm |
| **Isolation** | | |
| primary/secondary | Yes | Yes |
| **EMC** | | |
| Observance of line harmonic distortion to IEC 61000-3-2, IEC 61000-3-3 | | Yes |
| **Environmental requirements** | | |
| Degree and class of protection | | |
| • Class of protection | 1; with protective conductor | 1; with protective conductor |
| **Standards, approvals, certificates** | | |
| FM approval | Yes; up to 60 °C: T4 | Yes; up to 60 °C: T4 |
| **Dimensions** | | |
| Width | 50 mm | 50 mm |
| Height | 290 mm | 290 mm |
| Depth | 217 mm | 217 mm |
| **Dimensions** | | |
| Required slots | 2 | 2 |
| **Weights** | | |
| Weight, approx. | 1,200 g | 1,300 g |

## Technical specifications (continued)

| | 6AG1 407-0KA02-4AA0 | 6AG1 407-0KR02-4AA0 |
|---|---|---|
| **Power supply** | | |
| Input voltage | | |
| • Rated value, 110 V DC | Yes; Rated value 120 V DC | Yes; Rated value 120 V DC |
| • Rated value, 230 V DC | Yes | Yes |
| • permissible range, lower limit (DC) | 88 V | 88 V |
| • permissible range, upper limit (DC) | 300 V | 300 V |
| • Rated value, 120 V AC | Yes | Yes |
| • Rated value, 230 V AC | Yes | Yes |
| • permissible range, lower limit (AC) | 85 V | 85 V |
| • permissible range, upper limit (AC) | 264 V | 264 V |
| • Mains frequency | | |
| - Rated value 50 Hz | Yes | Yes |
| - Rated value 60 Hz | Yes | Yes |
| - permissible range, lower limit | 47 Hz | 47 Hz |
| - permissible range, upper limit | 63 Hz | 63 Hz |
| Input current | | |
| • Rated value at 110 V DC | 1 A; at 120 V DC | 1 A; at 120 V DC |
| • Rated value at 230 V DC | 0.5 A | 0.5 A |
| • Rated value at 120 V AC | 0.9 A | 0.9 A |
| • Rated value at 230 V AC | 0.5 A | 0.5 A |
| • Inrush current, max. | 63 A; Full width at half maximum 1 ms | 63 A; Full width at half maximum 1 ms |
| Output voltage | | |
| • Rated value, 5 V DC | Yes | |
| • Rated value, 24 V DC | Yes | |
| Output current | | |
| • for backplane bus (5 V DC), max. | 10 A; no base load required | 10 A; no base load required |
| • for backplane bus (24 V DC), max. | 1 A; Idling-proof | 1 A; Idling-proof |
| • Short-circuit protection | Yes | Yes |

| | 6AG1 407-0KA02-4AA0 | 6AG1 407-0KR02-4AA0 |
|---|---|---|
| **Supply voltages** | | |
| Power supply and voltage jumpering | | |
| • Mains/voltage failure jumpering | 20 ms | 20 ms |
| • Mains/power failure jumper to NAMUR recommendation | Yes | Yes |
| **Voltages and currents** | | |
| Power consumption | | |
| • Power consumption, typ. | 95 W | 95 W |
| **Current consumption** | | |
| Power loss, typ. | 20 W | 20 W |
| **Backup battery** | | |
| • Backup battery (optional) | Yes; 2 x lithium AA; 3.6 V/2.3 Ah | Yes; 2 x lithium AA; 3.6 V/2.3 Ah |
| **Connection point** | | |
| Connecting cables/cross sections | 3x 1.5 $mm^2$, solid or stranded wire with end sleeve, external diameter 3 to 9 mm | 3x 1.5 $mm^2$, solid or stranded wire with end sleeve, external diameter 3 to 9 mm |
| **Isolation** | | |
| primary/secondary | Yes | Yes |
| **EMC** | | |
| Observance of line harmonic distortion to IEC 61000-3-2, IEC 61000-3-3 | Yes | Yes |
| **Environmental requirements** | | |
| Degree and class of protection | | |
| • Class of protection | 1; with protective conductor | 1; with protective conductor |
| **Standards, approvals, certificates** | | |
| FM approval | Yes; Ta: 0 to 60 °C T4 | Yes; Ta: 0 to 60 °C T4 |
| **Dimensions** | | |
| Width | 50 mm | 50 mm |
| Height | 290 mm | 290 mm |
| Depth | 217 mm | 217 mm |
| **Dimensions** | | |
| Required slots | 2 | 2 |
| **Weights** | | |
| Weight, approx. | 1,200 g | 1,200 g |

## PS 405/407 power supply



| Ordering data | Order No. |
|---|---|
| **PS 405 power supply modules** | |
| 24 V DC; 5 V DC, 24 V DC | |
| 20 A, wide range | **6ES7 405-0RA02-0AA0** |
| **SIPLUS PS 405 power supply modules** | |
| (extended temperature range and medium load) | |
| 24 V DC; 5 V DC, 24 V DC | |
| 10 A, wide range | **6AG1 405-0KA02-2AA0** |
| **Power plug for PS 405** | **6ES7 490-0AA00-0AA0** |
| Spare part | |
| **Backup battery** | **6ES7 971-0BA00** |
| Type AA, 1.9 Ah | |

| | | Order No. |
|---|---|---|
| **SIPLUS PS 407 power supply modules** | | |
| (medium load) | | |
| 120/230 V AC; 5 V DC, 24 V DC | | |
| 10 A | | **6AG1 407-0KA02-4AA0** |
| 10 A, redundant | A) | **6AG1 407-0KR02-4AA0** |
| **Power plug for PS 407** | | **6ES7 490-0AB00-0AA0** |
| Spare part | | |
| **Backup battery** | | **6ES7 971-0BA00** |
| Type AA, 1.9 Ah | | |

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

# SIMATIC Industrial Software



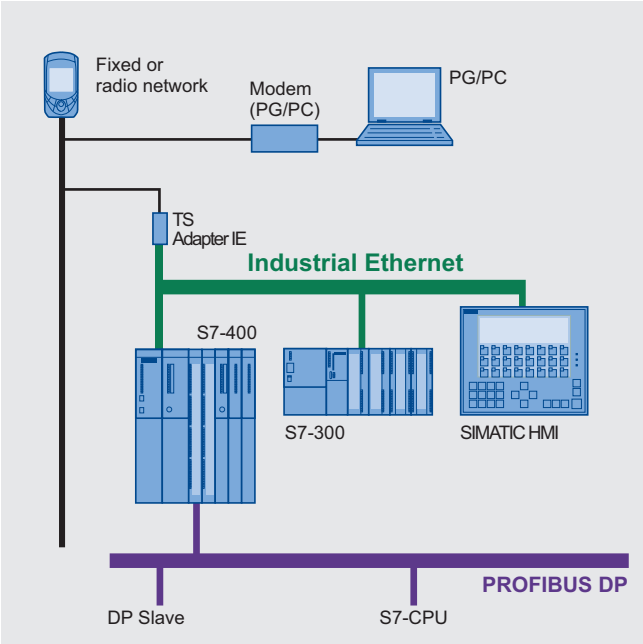
***Brochures***

For brochures serving as selection guides for SIMATIC products refer to:

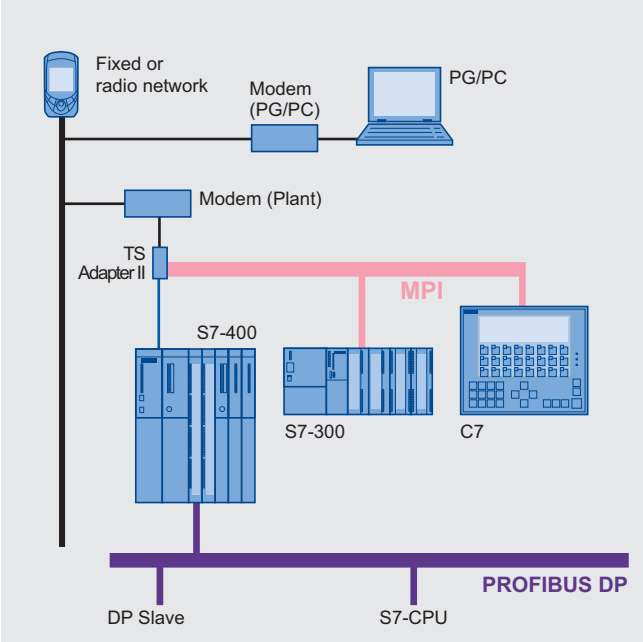
http://www.siemens.com/simatic/printmaterial

## TeleService

### Overview




Teleservice with TS Adapter IE




Teleservice with TS Adapter II

- For performing remote maintenance over the telephone network:
  A PG/PC with an Engineering Tool installed, e.g. STEP 7, can access automation components (e.g. S7 CPUs) over the telephone network that are connected to the appropriate adapters over Industrial Ethernet or PROFIBUS.
- Comprising the TeleService software and different adapters:
  - TS Adapter II for connection to PPI, MPI or PROFIBUS DP
  - TS Adapter IE for connection to Industrial Ethernet
- Additional functions with TS Adapter II:
  - Establishing a connection from/to remote plants, e.g. for calling up process data from an automation system (*PG-to-AS remote coupling*).
  - Exchanging data between plants (*AS-to-AS remote coupling*):
    Exchange of process data between two SIMATIC automation systems.
  - Sending a *text message*:
    Sending a text message from a SIMATIC automation system via a GSM wireless modem.
- Additional functions with TS Adapter IE:
  - Remote operation of HMI devices:
    Access to the HMI device via an Internet browser installed on the adapter
  - Sending e-mails:
    Establishing a modem link to a dial-up server (e.g. to an Internet service provider): A SIMATIC CPU can send e-mails over an e-mail server that can be accessed in this manner.
  - Standard routing:
    A modem link can be established to an Internet service provider for accessing data on the Internet.

### Technical specifications

For technical data for TeleService, see catalog ST 70 · 2007, page 7/34.

## Technical specifications TS-Adapter

| TS Adapter II | |
|---|---|
| Dimensions (W x H x D) in mm | 125 x 110 x 40 |
| Weight, approx. | 250 g |
| Interfaces | |
| • to S7/C7 | RS 485 (up to 12 Mbit/s) |
| • to the PC | USB 1.1 (12 Mbit/s) |
| • to an external modem | RS 232 (up to 115 kbaud) |
| • to the analog telephone network | RJ12 |
| • to the ISDN telephone network | RJ45 |
| Supply voltage, external or via MPI interface | 24 V DC |
| Current consumption | 60 mA (typ.) / 120 mA (max.) |
| Switch-on current, max. | 0.7 A; 8 µs |
| Type of protection | IP20 |
| Temperature | |
| • Operation | ± 0 °C to +60 °C |
| • Storage/transport | -40 °C to +70 °C |

| TS Adapter IE | |
|---|---|
| Dimensions (W x H x D) in mm | 125 x 110 x 40 |
| Weight, approx. | approx. 370 g |
| Interfaces | |
| • Ethernet | RJ45 (10/100 Mbit/s) |
| • to an external modem | RS 232 (up to 115 kbaud) |
| • to the analog telephone network | RJ12 |
| • to the ISDN telephone network | RJ45 |
| Supply voltage, external or via MPI interface | 24 V DC |
| Current consumption of the TSA-IE ISDN | typ. 170 mA / max. 230 mA |
| Current consumption of the modem TSA IE | typ. 180 mA / max. 240 mA |
| Switch-on current, max. | 0.7 A; 8 µs |
| Type of protection | IP20 |
| Temperature | |
| • Operation | ± 0 °C to +60 °C |
| • Storage/transport | -40 °C to +70 °C |

## Ordering data

| | | Order No. |
|---|---|---|
| **TeleService, Version 6.1**<br>*Task:*<br>Remote maintenance by means of wired or radio network<br>*Target system:*<br>SIMATIC S7-200, SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7<br>*Requirement:*<br>TS Adapter (STEP 7 not required)<br>*Delivery package:*<br>on CD, German, English, French, Spanish, Italian; with electronic documentation | | |
| Floating license | E) | **6ES7 842-0CE00-0YE0** |
| Floating License Upgrade (from each previous version) | E) | **6ES7 842-0CE00-0YE4** |
| Software Update Service | | **6ES7 842-0CA01-0YX2** |
| **TS Adapter II modem**<br>With MPI connection and RS 232; 9-pin, male | | **6ES7 972-0CB35-0XA0** |
| **TS Adapter II ISDN**<br>With MPI connection and RS 232; 9-pin, male | | **6ES7 972-0CC35-0XA0** |
| **TS Adapter IE modem**<br>With Ethernet connection RJ45 (10/100 Mbit/s) and RS 232; 9-pin, male | | **6ES7 972-0EM00-0XA0** |
| **TS Adapter IE ISDN**<br>With Ethernet connection RJ45 (10/100 Mbit/s) and RS 232; 9-pin, male | | **6ES7 972-0ED00-0XA0** |
| **SIMATIC Manual Collection**<br>Electronic manuals on DVD, five languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | D) | **6ES7 998-8XC01-8YE0** |
| **SIMATIC Manual Collection update service for 1 year**<br>Current "Manual Collection" DVD and the three subsequent updates | D) | **6ES7 998-8XC01-8YE2** |

D) Subject to export regulations: AL: N and ECCN: 5D992B1
E) Subject to export regulations: AL: N and ECCN: EAR99S

## Distributed Safety software

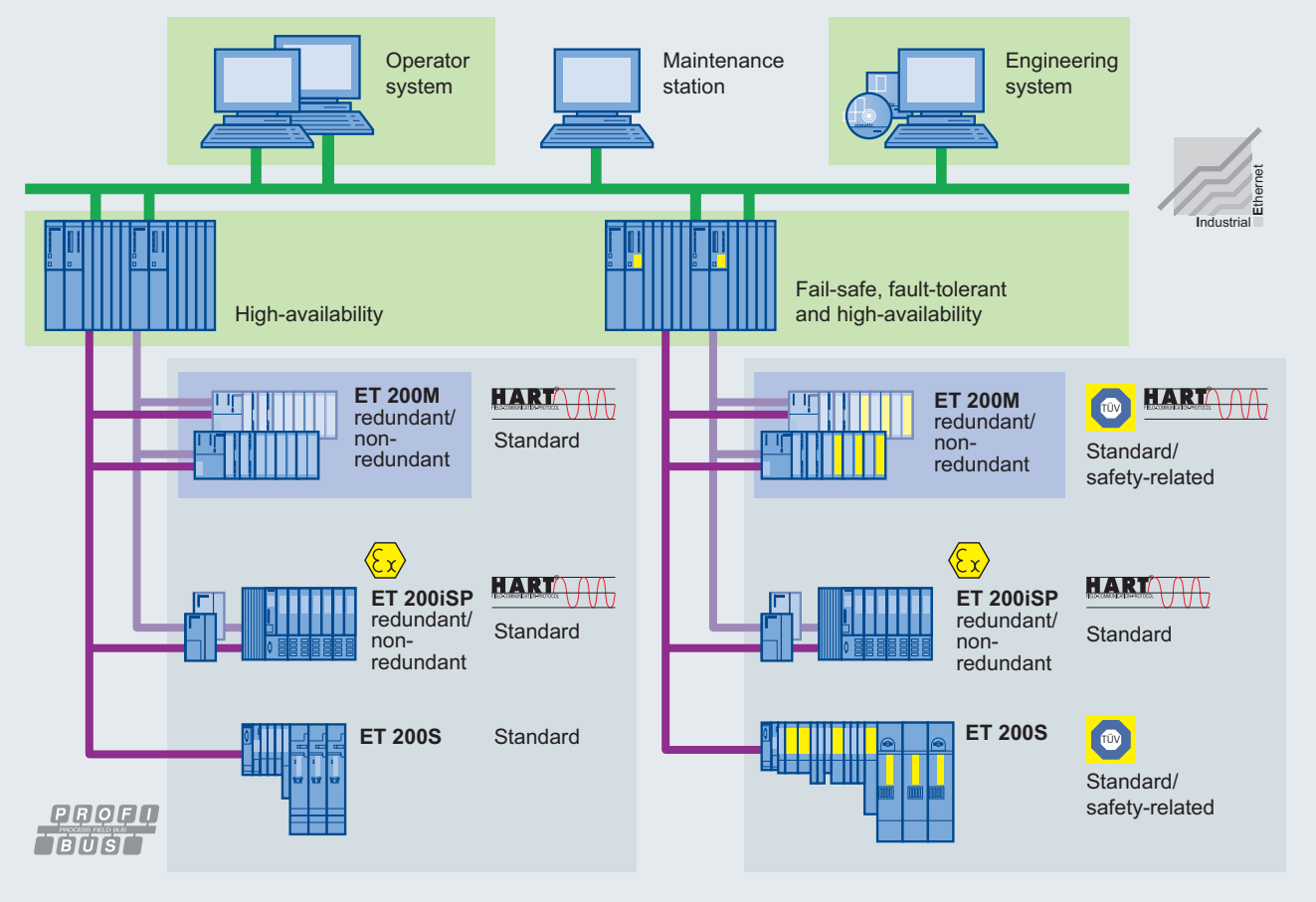
### Overview

- For creating safety-oriented automation applications with SIMATIC S7 in LAD or FBD (STEP 7 required)
- Implementation of safety functions by making simple connections between function blocks
- With preconfigured function block library
- User-defined blocks can be created
- Optimum embedding in the automation world due to guaranteed integration with STEP 7 tools
- Scope of supply:
  - Distributed Safety editor
  - Code generator
  - Debugger
  - Libraries of standard blocks

### Ordering data

| | Order No. |
|---|---|
| **Distributed Safety V5.4 programming tool** | |
| *Task:*<br>Software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, ET 200S<br>*Requirement:*<br>STEP 7 V5.3 SP3 and higher | |
| Floating license | **6ES7 833-1FC02-0YA5** |
| Software Update Service | **6ES7 833-1FC00-0YX2** |
| **Distributed Safety Upgrade** | |
| From V5.x to V5.4;<br>Floating license for 1 user | **6ES7 833-1FC02-0YE5** |
| **Single license for "fail-safe function blocks for burner systems" V 5.4** | **9AL3 100-1AD54** |
| License for one controller | |

## Overview




Common engineering system for basic process control system and safety instrumented system

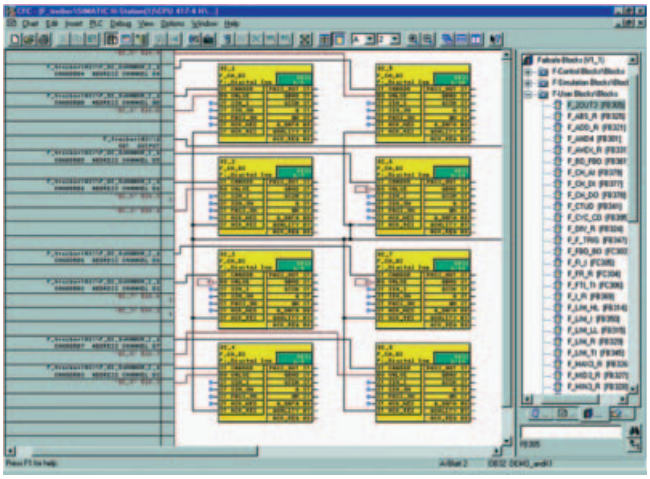
The process industry frequently features complex technological sequences with high safety demands, and faults and failures in the process automation could have fatal consequences for personnel, machines, plants and the environment. Therefore process safety is of particular significance. The safety technology used must reliably detect errors in the process and also its own internal errors, and automatically set the plant/application to a safe state if an error is detected.

S7 F/FH Systems is the comprehensive range of products and services from Siemens for safe, fault-tolerant applications in the process industry. This is characterized by:

- Safe communication via PROFIBUS with PROFIsafe
- Safe communication also via PROFIBUS PA with PROFIsafe
- ET 200 distributed I/O systems with safety-related I/O modules
- User-friendly process visualization, including safety-relevant fault messages, via the optional operator system
- Engineering system with S7 F Systems software package and SIMATIC Safety Matrix
- AS 412F/FH, AS 414F/FH and AS 417F/FH safety-related automation systems:
  The safety-related automation systems of the S7 F/FH-System are based on the hardware of the CPU 412H, CPU 414H or CPU 417H automation systems that are extended with the S7 F Systems software package to include safety functions. All F/FH systems listed are TÜV-certified and comply with the safety requirements up to SIL 3 according to IEC 61508. There are two design variants:
  - single-channel (with one CPU, safety-related)
  - high-availability (with redundant CPUs, safety-related and fault-tolerant).

# S7 F/FH Systems: S7 F Systems

## Overview



The S7 F Systems engineering tool integrated in the SIMATIC Manager can be used to configure an S7 F/FH System. With this tool you can:

- Parameterize CPU and F-signal modules
- Create safety-related applications in the CFC.

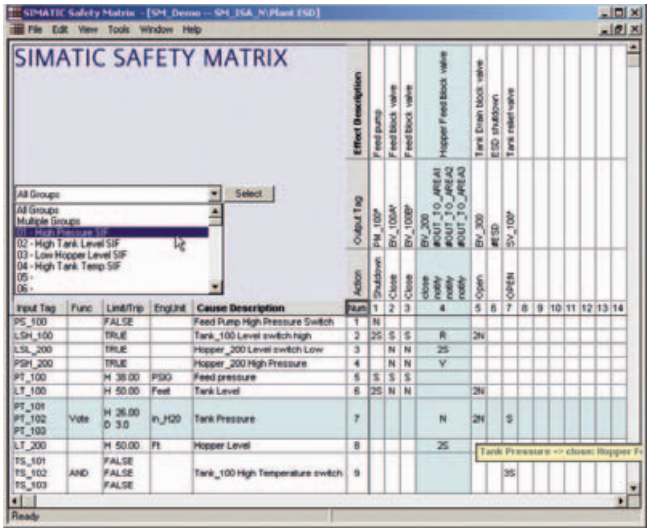
Predefined, TÜV-approved blocks are available for this purpose. The safety-related blocks save the user having to perform redundant programming for detecting and reacting to errors.

## Ordering data

| | Order No. |
|---|---|
| **S7 F Systems RT license**<br>For processing safety-related application programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH | **6ES7 833-1CC00-6YX0** |
| **S7 F Systems V6.0**<br>Programming and configuring environment for creating and operating safety-related STEP 7 programs for an S7 400H-based target system, floating license for 1 user, executable under Windows XP Prof SP2, Windows 2000 SP4, Windows Server 2003 SP1/SP2<br>2 languages (German, English)<br>*Type of supply:*<br>Certificate of license as well as software and electronic documentation on CD | **6ES7 833-1CC01-0YA5** |
| **S7 F Systems Upgrade from V5.x to V6.0**<br>2 languages (German, English), floating license for 1 user<br>*Type of supply:*<br>Certificate of license as well as software and electronic documentation on CD | **6ES7 833-1CC01-0YE5** |

**Note:**
In the case of an S7 F Systems Upgrade from V5.x to V6.0, the type of S7 F Systems license changes from single license to floating license.

## Overview




The SIMATIC Safety Matrix which can be used in addition to the CFC is an innovative safety lifecycle tool from Siemens that can be used not only for user-friendly configuration of safety applications, but also for their operation and service. The tool, which is based on the proven principle of a cause & effect matrix, is ideally suited to processes where defined statuses require specific safety reactions.

The SIMATIC Safety Matrix not only means that programming of the safety logic is significantly simpler and more convenient, but also much faster than in the conventional manner. During the risk analysis of a plant, the configuration engineer can assign exactly defined reactions (effects) to events (causes) which may occur during a process.

## Ordering data

| | | Order No. |
|---|---|---|
| **SIMATIC Safety Matrix Tool**<br>Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment<br>Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with several operator control levels<br>1 language (English), executes with Windows XP Professional, single license for 1 installation<br>Type of supply: Certificate of license and authorization diskette for Safety Matrix Tool and Safety Matrix Viewer; software and electronic documentation on CD | E) | **6ES7 833-1SM00-0YA5** |
| **SIMATIC Safety Matrix Editor**<br>Creation and checking of the Safety Matrix logic on an external computer without a SIMATIC PCS 7 or STEP 7 environment<br>1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation<br>Type of supply: Certificate of license and authorization diskette; software and electronic documentation on CD | E) | **6ES7 833-1SM40-0YA5** |
| **SIMATIC Safety Matrix Viewer for SIMATIC PCS 7**<br>Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with several operating levels<br>1 language (English), executes with Windows 2000 Professional or Windows XP Professional, single license for 1 installation<br>Type of supply: Certificate of license and authorization diskette; software and electronic documentation on CD | E) | **6ES7 833-1SM60-0YA5** |

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

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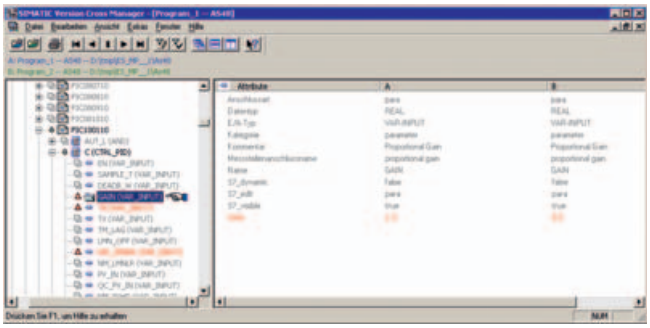
# Version Cross Manager

## Overview



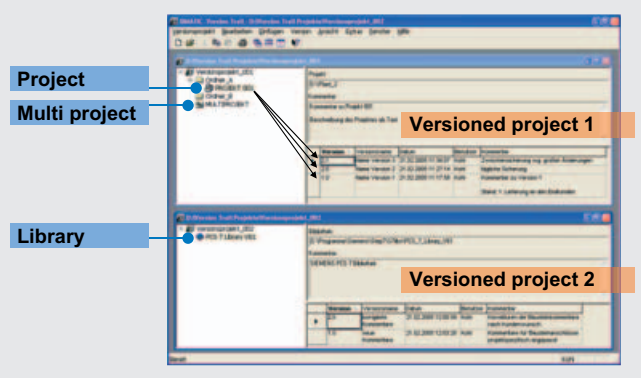
The SIMATIC Version Cross Manager is a user-friendly tool for determining the differences between various versions of individual projects or multi-projects by:

- Tracing missing, additional or differing objects by comparing hardware configuration, communication, technological hierarchy, CFC/SFC plans, SFC details, block types, alarms, global variables, signals and run sequences
- Graphic display of comparison results in a combination of tree and tabular formats
- Clear hierarchical structuring according to the technological hierarchy of the plant
- Color-coded identification of the differences

## Ordering data

| | Order No. |
|---|---|
| **SIMATIC Version Cross Manager V7.0**<br>6 languages (German, English, French, Spanish, Italian, Chinese), executes with Windows 2000 Professional, Windows XP Professional or Windows Server 2003, floating license for 1 user<br>Type of delivery:<br>License key disk, emergency key disk, certificate of license, terms and conditions as well as TIA toolset CD V7.0 | **6ES7 658-1CX07-2YA5** |
| **SIMATIC Version Cross Manager Upgrade V7.0 for upgrading from Version Cross Checker V6.0/V6.1 to Version Cross Manager V7.0**<br>6 languages (German, English, French, Spanish, Italian, Chinese), executes with Windows 2000 Professional, Windows XP Professional or Windows Server 2003, floating license for 1 user<br>Type of delivery:<br>License key disk, emergency key disk, certificate of license, terms and conditions as well as TIA toolset CD V7.0 | **6ES7 658-1CX07-2YE5** |

## Overview



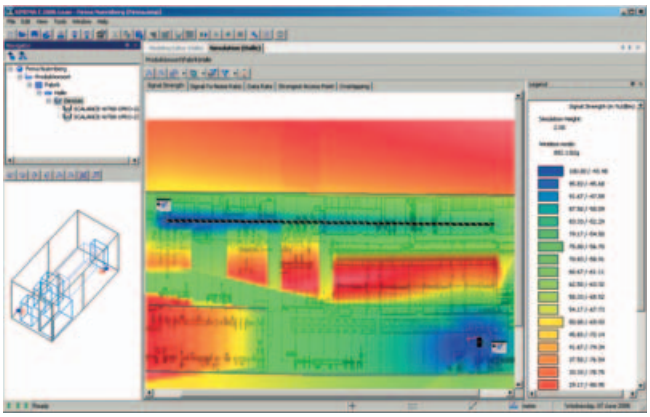

SIMATIC Version Trail is a software option for engineering which, together with the SIMATIC Logon central user administration, can assign a version history to libraries, projects and multi-projects. It can be used within SIMATIC PCS 7 or also in the context of Totally Integrated Automation with SIMATIC.

## Ordering data

| | Order No. |
|---|---|
| **SIMATIC Version Trail V7.0**<br>6 languages (German, English, French, Spanish, Italian, Chinese), executes with Windows 2000 Professional, Windows XP Professional or Windows Server 2003, floating license for 1 user<br>Type of delivery: License key disk, emergency key disk, certificate of license, terms and conditions as well as TIA toolset CD V7.0 | **6ES7 658-1FX07-2YA5** |
| **SIMATIC Version Trail Upgrade V7.0**<br>6 languages (German, English, French, Spanish, Italian, Chinese), executes with Windows 2000 Professional, Windows XP Professional or Windows Server 2003, floating license for 1 user<br>Type of delivery: License key disk, emergency key disk, certificate of license, terms and conditions as well as TIA toolset CD V7.0 | **6ES7 658-1FX07-2YE5** |

## SINEMA E

### Overview



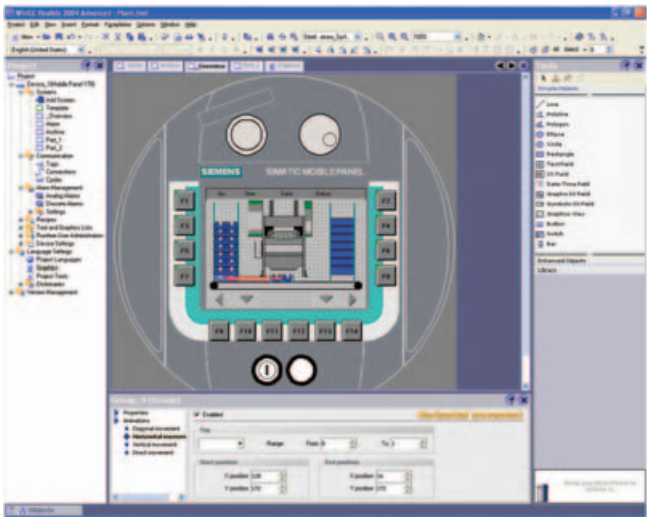
- Engineering tool for support with planning, configuration, simulation and measurement of an IWLAN radio field on site (Site Survey) according to the IEEE 802.11 a/b/g/h standard
- Automatic determination of the optimal WLAN infrastructure for new and existing networks
- Optimization functions for minimization of channel interference
- Visualization and analysis of WLAN networks according to signal strength, data rate, signal-to-noise ratio, overlapping and applications (PROFINET, TCP/IP, Voice over WLAN)
- Configuration of single and multiple devices as well as uploading/downloading of IWLAN device parameters
- Site survey functions (measurements) for the acquisition, conditioning, evaluation and visualization of measured WLAN signals
- Integrated and expandable catalog entries for WLAN devices, antennas and radio hindrances as well as standard graphics formats for importing layout plans
- Report function for documenting the configured and measured WLAN infrastructure

### Ordering data

| | | Order No. |
|---|---|---|
| **SINEMA E** | | |
| Engineering software for planning, configuring, simulating and measuring (Site Survey) industrial WLAN applications in office and industrial environments on PG/PC in accordance with the 802.11 a/b/g/h standard; software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional +SP2; German/English | | |
| • **SINEMA E 2006 Lean**<br>Planning, configuring and simulating WLAN applications | D) | **6GK1 781-0AA00-6AA0** |
| • **SINEMA E 2006 Standard**<br>Extended planning, configuring, simulating and measuring (site survey) of WLAN applications (automatic placement, application profile, contour presentation, storage/comparison of simulations, extended filter options) | D) | **6GK1 782-0AA00-6AA0** |
| • **SINEMA E 2006 Powerpack**<br>Software upgrade from SINEMA E Lean to SINEMA E Standard | D) | **6GK1 782-4AA00-6AC0** |

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

## Overview



- Uniform family of **engineering tools** for configuring SIMATIC HMI Operator Panels, the operator control part of SIMATIC C7 units, SIMOTION/SINUMERIK Panel PCs as well as the PC-based visualization software WinCC flexible Runtime
- Executable under Windows 2000/XP Professional
- **Current version:**
  - SIMATIC WinCC flexible 2007 Advanced
  - SIMATIC WinCC flexible 2007 Standard
  - SIMATIC WinCC flexible 2007 Compact
  - SIMATIC WinCC flexible 2007 Micro

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## Ordering data

| | | Order No. |
|---|---|---|
| **WinCC flexible 2007 Advanced** | D) | **6AV6 613-0AA51-2CA5** |
| Floating license, on DVD incl. license key, includes:<br>• Engineering software for configuring WinCC flexible Runtime on PC/Panel PC basis as well as Micro Panels and 70/170/270/370 series Panels incl. C7-635/636<br>• SW for WinCC flexible /ChangeControl engineering option [1]<br>• Simulation software for WinCC flexible Runtime as well as Micro Panels and 70/170/270/370 series Panels incl. C7-635/636<br>• Native drivers<br>• Electronic documentation (.pdf) in German, English, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean, Japanese | | |
| **WinCC flexible 2007 Standard** | D) | **6AV6 612-0AA51-2CA5** |
| Floating license, on DVD incl. license key, includes:<br>• Engineering software for configuring Micro Panels and 70/170/270/370 series Panels incl. C7-635/636<br>• SW for WinCC flexible /ChangeControl engineering option [1]<br>• Simulation software for Micro Panels and 70/170/270/370 series Panels incl. C7-635/636<br>• Native drivers<br>• Electronic documentation (.pdf) in German, English, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean, Japanese | | |

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

1) A separate license for WinCC flexible/ChangeControl must be purchased for each engineering station.

## SIMATIC WinCC flexible ES

### Ordering data (continued)

| | | Order No. |
|---|---|---|
| **WinCC flexible 2007 Compact**<br>Floating license, on DVD incl. license key, includes:<br>• Engineering software for configuring Micro Panels and 70/170 series Panels incl. C7-635<br>• SW for WinCC flexible /ChangeControl engineering option [1]<br>• Simulation software for Micro Panels and 70/170 series Panels incl. C7-635<br>• Native drivers<br>• Electronic documentation (.pdf) in German, English, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean, Japanese | D) | **6AV6 611-0AA51-2CA5** |
| **WinCC flexible 2007 Micro**<br>Floating license, on DVD without license key, includes:<br>• Engineering software for configuring Micro Panels<br>• Electronic documentation (.pdf) in English, German, French, Italian, Spanish | D) | **6AV6 610-0AA01-2CA8** |
| **WinCC flexible /ChangeControl for WinCC flexible 2007 Compact/Standard/Advanced [3]**<br>Floating License, option, license key only | D) | **6AV6 613-6AA01-2AB5** |
| **Power Packs** | | |
| **SIMATIC WinCC flexible Power Packs**<br>Single license, license key only | | |
| • WinCC flexible 2007 Standard to 2007 Advanced | D) | **6AV6 613-2CD01-2AD5** |
| • WinCC flexible 2007 Compact to 2007 Advanced | D) | **6AV6 613-2BD01-2AD5** |
| • WinCC flexible 2007 Standard to 2007 Standard | D) | **6AV6 612-2BC01-2AD5** |
| **Software Update Service** | | |
| **Software Update Service SIMATIC WinCC flexible [2]** | | |
| • WinCC flexible Advanced | D) | **6AV6 613-0AA00-0AL0** |
| • WinCC flexible Standard | D) | **6AV6 612-0AA00-0AL0** |
| • WinCC flexible Compact | D) | **6AV6 611-0AA00-0AL0** |

| | | Order No. |
|---|---|---|
| ***Upgrades*** | | |
| **SIMATIC ProTool to SIMATIC WinCC flexible 2007** | | |
| • ProTool/Lite to WinCC flexible 2007 Compact | D) | **6AV6 611-3AA51-2CE5** |
| • ProTool to WinCC flexible 2007 Standard | D) | **6AV6 612-3AA51-2CE5** |
| • ProTool/Pro to inCC flexible 2007 Advanced | D) | **6AV6 613-3AA51-2CE5** |
| **SIMATIC WinCC flexible 2004/2005 to SIMATIC WinCC flexible 2007** | | |
| • WinCC flexible 2004/2005 Compact to WinCC flexible 2007 Compact, incl. ChangeControl option [1] | D) | **6AV6 611-0AA51-2CE5** |
| • WinCC flexible 2004/2005 Standard to WinCC flexible 2007 Standard, incl. ChangeControl option [1] | D) | **6AV6 612-0AA51-2CE5** |
| • WinCC flexible 2004/2005 Advanced to WinCC flexible 2007 Advanced, incl. ChangeControl option [1] | D) | **6AV6 613-0AA51-2CE5** |
| ***Versions for China/Taiwan/Korea/Japan*** | | |
| **WinCC flexible 2007 ASIA Standard**<br>Floating license, on DVD incl. license key, includes:<br>• Engineering software for configuring Micro Panels and 70/170/270/370 series Panels incl. C7-635/636<br>• Simulation software for Micro Panels and 70/170/270/370 series Panels incl. C7-635/636<br>• Native drivers<br>• Electronic documentation (.pdf) in German, English, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean, Japanese | D) | **6AV6 612-0AA11-2CA5** |

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

1) A separate license for WinCC flexible/ChangeControl must be purchased for each engineering station.

2) For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed WinCC flexible engineering system or option. The contract is automatically extended by a further year unless canceled up to 12 weeks prior to expiration.

3) The ChangeControl option has not been released for integrated operation with STEP 7.

## Ordering data (continued)

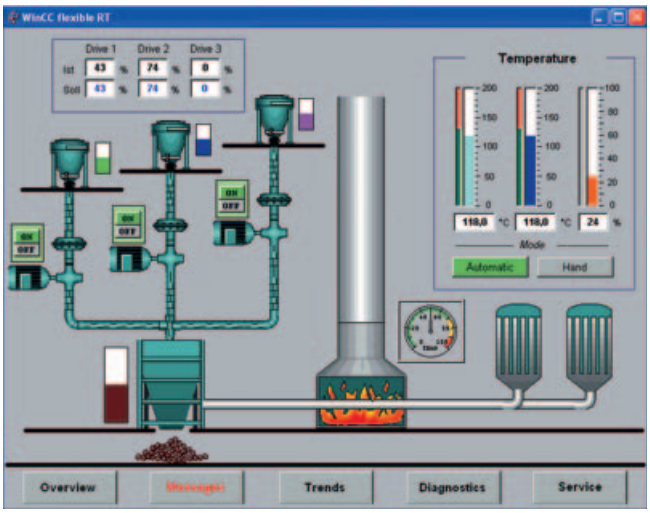
| | Order No. |
|---|---|
| **WinCC flexible 2007 ASIA Advanced** D) | **6AV6 613-0AA11-2CA5** |
| Floating license, on DVD incl. license key, includes: | |
| • Engineering software for configuring WinCC flexible Runtime as well as Micro Panels and 70/170/270/370 series Panels incl. C7-635/636 | |
| • SW for WinCC flexible /ChangeControl engineering option 1) | |
| • Simulation software for WinCC flexible Runtime as well as Micro Panels and 70/170/270/370 series Panels incl. C7-635/636 | |
| • Native drivers | |
| • Electronic documentation (.pdf) in German, English, French, Italian, Spanish, simplified Chinese, traditional Chinese, Korean, Japanese | |
| ***Documentation (must be ordered separately*** | |
| **User Manual WinCC flexible Communication** | |
| • German | **6AV6 691-1CA01-2AA0** |
| • English | **6AV6 691-1CA01-2AB0** |
| • French | **6AV6 691-1CA01-2AC0** |
| • Italian | **6AV6 691-1CA01-2AD0** |
| • Spanish | **6AV6 691-1CA01-2AE0** |

| | Order No. |
|---|---|
| **WinCC flexible Micro User Manual** | |
| • German | **6AV6 691-1AA01-2AA0** |
| • English | **6AV6 691-1AA01-2AB0** |
| • French | **6AV6 691-1AA01-2AC0** |
| • Italian | **6AV6 691-1AA01-2AD0** |
| • Spanish | **6AV6 691-1AA01-2AE0** |
| **User Manual WinCC flexible Compact/Standard/Advanced** | |
| • German | **6AV6 691-1AB01-2AA0** |
| • English | **6AV6 691-1AB01-2AB0** |
| • French | **6AV6 691-1AB01-2AC0** |
| • Italian | **6AV6 691-1AB01-2AD0** |
| • Spanish | **6AV6 691-1AB01-2AE0** |
| **SIMATIC HMI Manual Collection** E) | **6AV6 691-1SA01-0AX0** |
| Electronic documentation, on DVD | |
| 5 languages (English, French, German, Italian, Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI | |

D) Subject to export regulations: AL: N and ECCN: 5D992B1
E) Subject to export regulations: AL: N and ECCN: EAR99S
1) A separate license for WinCC flexible/ChangeControl must be purchased for each engineering station.

## SIMATIC WinCC flexible RT

### Overview




- **PC-based visualization software** for single-user systems directly at the machine
- Executable under Windows 2000/XP Professional
- **Current version:**
  - SIMATIC WinCC flexible 2007 Runtime with 128, 512 or 2048 PowerTags
- SIMATIC WinCC flexible Runtime is configured with SIMATIC WinCC flexible Advanced engineering software.

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### Technical specifications

| Type | SIMATIC WinCC flexible Runtime |
|---|---|
| | The specifications are maximum values |
| **Displays** | 500 |
| • Fields per screen | 400 |
| • Variables per screen | 400 |
| • Static text | 30000 |
| • Graphics objects | 2000 |
| • Complex objects per display (e.g. bars) | 40 |
| • Trends | 800 |
| • Graphics lists [1] | 500 |
| • Text lists [1] | 500 |
| • Number of entries in symbol tables | 3500 |
| **Variables** | 2048 [3] |
| **Messages bit-triggered / analog** | 4000 / 500 |
| • Message text (number of characters) | 80 |
| • Number of process values per message | 8 |
| • Size of message buffer | 1024 |
| • Pending message events | 500 |
| **Archives** [4] | 100 |
| • Archivable data | Process values (max. 100), messages |
| • Max. number of entries per archive (incl. sequence archive) | 500000 |
| • Archive types | Short-term archive, sequence archive (max. 400 per archive) |
| • Data storage format | CSV (**C**omma **S**eparated **V**ariable) and interface to ODBC database (database not included in scope of delivery) |

| Type | SIMATIC WinCC flexible Runtime |
|---|---|
| | The specifications are maximum values |
| **Recipes**[4] | 1000 |
| • Elements per recipe | 2000 [3] |
| • Data records per recipe | 5000 [2] |
| **Password protection** | |
| • User rights | 32 |
| • Number of user groups | 10 |
| **Visual Basic scripts** | 200 |
| **Online languages, max.** | 16 |
| **Communication** | |
| SIMATIC S7 MPI interface/ PROFIBUS DP interface | |
| • Number of connectable stations, max. | Depending on the scope of the configuration (communication) from the point of view of WinCC flexible Runtime, as many as 8 connections are possible |
| SIMATIC S7 PPI interface | |
| • Number of connectable stations, max. | 1 from viewpoint of WinCC flexible Runtime |
| SIMATIC S5 PROFIBUS DP interface | |
| • Number of connectable stations, max. | 1 from viewpoint of WinCC flexible Runtime |
| Multi-protocol operation | Yes, OPC Client or SIMATIC HMI HTTP protocol are additive, i.e. can be used in conjunction with other PLC links |

1) Together only 500 text and graphics lists
2) Dependent on memory medium used
3) Dependent on number of licensed PowerTags
4) Options for SIMATIC WinCC flexible Runtime

| Ordering data | | Order No. |
|---|---|---|
| **SIMATIC WinCC flexible 2007 Runtime** | | |
| for PC systems; incl. SW for PC systems options [1] Single license, on CD-ROM incl. licensing, for: | | |
| • 128 PowerTags (RT 128) | D) | **6AV6 613-1BA51-2CA0** |
| • 512 PowerTags (RT 512) | D) | **6AV6 613-1DA51-2CA0** |
| • 2048 PowerTags (RT 2048) | D) | **6AV6 613-1FA51-2CA0** |
| ***Power Packs*** | | |
| **SIMATIC WinCC flexible 2007 Runtime** | | |
| Single license, only authorization for PowerTags, from | | |
| • 128 to 512 PowerTags | D) | **6AV6 613-4BD01-2AD0** |
| • 128 to 2048 PowerTags | D) | **6AV6 613-4BF01-2AD0** |
| • 512 to 2048 PowerTags | D) | **6AV6 613-4DF01-2AD0** |
| ***Upgrades*** | | |
| **SIMATIC ProTool/Pro RT to SIMATIC WinCC flexible 2007** | | |
| • ProTool/Pro Runtime 128 PowerTags to WinCC flexible 2007 Runtime 128 PowerTags [2] | D) | **6AV6 613-3BB51-2CE0** |
| • ProTool/Pro Runtime 256 PowerTags to WinCC flexible 2007 Runtime 512 PowerTags [2] | D) | **6AV6 613-3CD51-2CE0** |
| • ProTool/Pro Runtime 512 PowerTags to WinCC flexible 2007 Runtime 512 PowerTags [2] | D) | **6AV6 613-3DD51-2CE0** |
| • ProTool/Pro Runtime 2048 PowerTags to WinCC flexible 2007 Runtime 2048 PowerTags [2] | D) | **6AV6 613-3FF51-2CE0** |
| **SIMATIC WinCC flexible 2004/2005 Runtime to SIMATIC WinCC flexible 2007 Runtime** | | |
| • SIMATIC WinCC flexible RT 2004/2005 to WinCC flexible RT 2007; PowerTags incl. Runtime options for: | D) | **6AV6 613-1XA51-2CE0** |
| - WinCC flexible/Sm@rtAccess | | |
| - Sm@rtService | | |
| - OPC server | | |
| - Logs | | |
| - Recipes | | |
| - ProAgent | | |
| - Audit | | |

D) Subject to export regulations: AL: N and ECCN: 5D992B1
E) Subject to export regulations: AL: N and ECCN: EAR99S

| | | Order No. |
|---|---|---|
| **SIMATIC WinCC flexible 2004/2005 Runtime to SIMATIC WinCC flexible 2007 Runtime** (continued) | | |
| • Panel options: | D) | **6AV6 618-7XX01-2AF0** |
| - SIMATIC WinCC flexible 2004/2005 to WinCC flexible 2007 | | |
| - SIMATIC Panel Options for WinCC flexible 2007 | | |
| - WinCC flexible /Sm@rtAccess for SIMATIC Panel | | |
| - WinCC flexible /Sm@rtService for SIMATIC Panel | | |
| - WinCC flexible OPC server for SIMATIC Multi Panel | | |
| - WinCC flexible ProAgent for SIMATIC Multi Panel | | |
| - WinCC flexible Audit for SIMATIC Panel | | |
| ***Documentation (must be ordered separately)*** | | |
| **User Manual WinCC flexible Runtime** | | |
| • German | | **6AV6 691-1BA01-2AA0** |
| • English | | **6AV6 691-1BA01-2AB0** |
| • French | | **6AV6 691-1BA01-2AC0** |
| • Italian | | **6AV6 691-1BA01-2AD0** |
| • Spanish | | **6AV6 691-1BA01-2AE0** |
| **User Manual WinCC flexible Communication** | | |
| • German | | **6AV6 691-1CA01-2AA0** |
| • English | | **6AV6 691-1CA01-2AB0** |
| • French | | **6AV6 691-1CA01-2AC0** |
| • Italian | | **6AV6 691-1CA01-2AD0** |
| • Spanish | | **6AV6 691-1CA01-2AE0** |
| **SIMATIC HMI Manual Collection** | E) | **6AV6 691-1SA01-0AX0** |
| Electronic documentation, on DVD | | |
| 5 languages (English, French, German, Italian, Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI | | |

1) Runtime licenses for WinCC flexible Runtime options must be purchased separately for each target system.
2) each including a single license WinCC flexible/Archives and WinCC flexible/Recipes

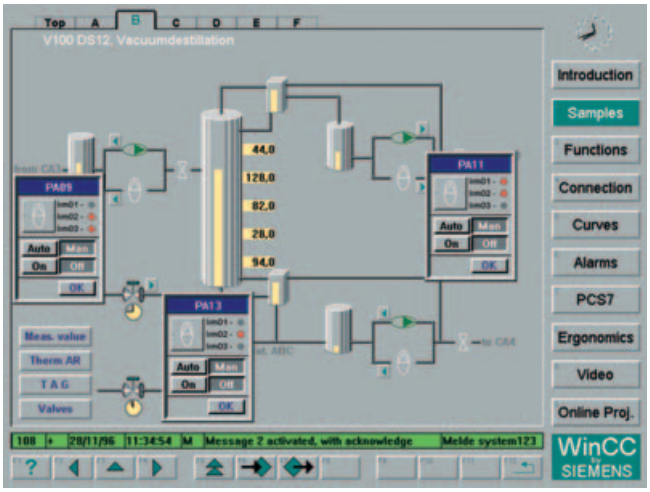
## SIMATIC WinCC flexible RT

### Ordering data (continued)

| | | Order No. |
|---|---|---|
| ***Communication via Industrial Ethernet*** | | |
| **CP 1613-A2** | A) | **6GK1 161-3AA01** |
| PCI card (32 bits) for connecting a PG/PC to Industrial Ethernet (communications software must be ordered separately) | | |
| **SIMATIC NET IE S7-1613/2006** | | |
| Software for S7 and S5 communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, Windows 2003 Server, Windows 2000 Professional/ Server; for CP 1613/CP 1613 A2 German/English | | |
| • Single license | | **6GK1 716-1CB64-3AA0** |
| • Upgrade package | | **6GK1 716-1CB64-3AE0** |
| ***Communication via PROFIBUS*** | | |
| **CP 5613-A2** | | **6GK1 561-3AA01** |
| PCI card (32-bit) for connecting a PC to PROFIBUS (communications software must be ordered separately). | | |
| **CP 5614-A2** | | **6GK1 561-4AA01** |
| PCI card (32-bit) for connecting a PC to PROFIBUS (communications software must be ordered separately). | | |
| **SIMATIC NET PB S7-5613/2006** | | |
| Software for S7 communication, incl. PG and FDL protocol, OPC server and NCM PC; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional; Windows 2003 Server, 2000 Professional/Server, for CP 5613, CP 5614, EL/FO German/English | | |
| • Single license | | **6GK1 713-5CB64-3AA0** |
| • Upgrade package | | **6GK1 713-5CB64-3AE0** |
| **CP 5512** | | **6GK1 551-2AA00** |
| PCMCIA card (32-bit CARDBUS) for connecting a PG/Notebook to PROFIBUS or MPI (communications software included in WinCC flexible). | | |
| **CP 5611-A2** | A) | **6GK1 561-1AA01** |
| PCI card (32-bit) for connecting a PG/PC to PROFIBUS (communications software included in WinCC flexible basic package) | | |
| **CP 5611 MPI** | A) | **6GK1 561-1AM01** |
| Comprising CP 5611 A2 (32-bit) and MPI cable, 5 m | | |
| **PC/PPI adapter** | A) | **6ES7 901-3CB30-0XA0** |
| RS 232, 9-pin; male with RS 232/PPI converter, max. 19.2 kbit/s | | |
| **PC/MPI adapter** | | **6ES7 972-0CA23-0XA0** |
| RS 232, 9-pin; male with RS 232/MPI converter | | |
| **PC adapter USB** | | **6ES7 972-0CB20-0XA0** |
| For use with Windows 2000/XP | | |

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

## Overview




- PC-based operator control and monitoring system for visualizing and operating processes, production flows, machines and plants in all sectors - with the simple single-user station through to distributed multi-user systems with redundant servers and cross-location solutions with Web clients. WinCC is the information hub for corporation-wide vertical integration.
- The basic system configuration (WinCC basic software) includes industry-standard functions for signaling and acknowledging events, archiving of messages and measured values, logging of all process and configuration data, user administration and visualization.
- The WinCC basic software forms the core of a wide range of different applications. Based on the open programming interfaces, a wide range of WinCC options (from Siemens A&D) and WinCC add-ons have been developed (by Siemens-internal and external partners).
- Current versions:
  - **SIMATIC WinCC V6.2:**
    Runs under Windows XP Professional/Windows 2003 Server/Windows 2003 Server R2 and Windows 2000 Professional

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## Technical specifications

| Type | SIMATIC WinCC V6.2 |
|---|---|
| **Operating system** | Windows XP Professional SP2, Windows 2000 Professional SP4, Windows Server 2003 SP1, Windows Server 2003 R2<br>WebClient/DataMonitor Client additionally: Windows XP SP2, Windows Server 2003 terminal services |
| **PC hardware requirements** | |
| **Processor type** [1] | |
| • Minimum | Single-user station/server: Pentium III, 1 GHz<br>Central archive server: Pentium 4, 2 GHz<br>Client: Pentium III, 600 MHz<br>WebClient/DataMonitor Client: Pentium III, 300 MHz |
| • Recommended | Single-user station/server: Pentium 4, 2 GHz<br>Central archive server: Pentium 4, 2.5 GHz<br>Client: Pentium III, 1 GHz<br>WebClient/DataMonitor Client: Pentium III, 1 GHz |

| Type | SIMATIC WinCC V6.2 |
|---|---|
| **RAM** | |
| • Minimum | Single-user station: 512 MB, server: 1 GB<br>Central archive server: 1 GB<br>Client: 512 MB<br>WebClient/DataMonitor Client: 256 MB |
| • Recommended | Single-user station: ≥ 1 GB, server: >1 GB<br>Central archive server: ≥ 2 GB<br>Client: 512 MB<br>WebClient/DataMonitor Client: 512 MB |
| **Graphics card** | |
| • Minimum | SVGA (16 MB), 800 x 600 |
| • Recommended | SXGA (32 MB), 1280 x 1024 |
| **Hard disk drive** | |
| • Minimum | Single-user station/server: 20 GB<br>Client: 5 GB<br>WebClient/DataMonitor Client: 5 GB |
| • Recommended | Single-user station/server: 80 GB<br>Client: 20 GB<br>WebClient/DataMonitor Client: 10 GB |
| • Hard disk (free memory space for installation) | |
| - minimum | Server: 1.5 GB<br>Client: 1 Gbyte |
| - recommended | Server: >10 GB<br>Client: >1.5 GB |
| **CD-ROM/DVD-ROM/diskette drive** | for software installation |

1) An AMD system with comparable performance can also be used

## Technical specifications (continued)

| Type | SIMATIC WinCC V6.2 |
|---|---|
| **Functionality/Quantity framework** | |
| Messages (number) | 50.000 |
| • Message text (number of characters) | 10 x 256 |
| • Alarm log | > 500,000 messages [1] |
| • Process values per message | 10 |
| • Continuous number of messages, max. | Central archive server: 100/sec<br>Server/single-user station: 10/sec |
| • Burst of messages, max. | Server/single-user station: 2,000/10 sec every 5 min |
| Archives | |
| • Archive data points | Max. 120,000 per server [2] |
| • Archive types | Short-term archive with and without long-term archiving |
| • Data storage format | Microsoft SQL Server 2005 |
| • Measured values per second, max. | Server/single-user station: 5,000/sec |
| User archive | |
| • Archives (recipes) | System-limited [3] |
| • Data records per user archive | 65.536 [3] |
| • Fields per user archive | 500 [3] |
| Graphics system | |
| • Number of screens | System-limited [1] |
| • Number of objects per screen | System-limited [1] |
| • Number of controllable fields per screen | System-limited [1] |

| Type | SIMATIC WinCC V6.2 |
|---|---|
| Process variables | 64 K [4] |
| Trends | |
| • Curve windows per image | 25 |
| • Curves per curve window | 80 |
| User administration | |
| • User groups | 128 |
| • Number of users | 128 |
| • Authorization groups | 999 |
| Configuration languages | 5 European (Eng, Fre, Ger, Ita, Spa), 4 Asian (simpl.+trad. Chi/Kor/Jpn) [5] |
| Protocols | |
| • Message sequence reports (concurrent) | 1 per server/single-user station |
| • Message archive reports (concurrent) | 3 |
| • User reports | System-limited [1] |
| • Report lines per group | 66 |
| • Variables per report | 300 [6] |
| Multi-user station | |
| • Server | 12 |
| • Clients for server with operator station | 4 |
| • Clients for server without operator station | 32 clients + 3 WebClients or 50 WebClients + 1 client |

1) Dependent on available memory space
2) Dependent on number of licensed archive variables
3) The sum of the number of fields and number of data sets must not exceed a value of 320,000
4) Dependent on number of licensed PowerTags
5) Current version V6.2
6) The number of variables per report is dependent on process communication performance

## Ordering data

| | Order No. |
|---|---|
| ***SIMATIC WinCC system software V6.2*** | |
| **Runtime packages on CD-ROM** | |
| Language/script versions: DE/EN/FR/IT/ES; with license for | |
| • 128 PowerTags (RT 128) | **6AV6 381-1BC06-2AX0** |
| • 256 PowerTags (RT 256) | **6AV6 381-1BD06-2AX0** |
| • 1024 PowerTags (RT 1024) | **6AV6 381-1BE06-2AX0** |
| • 8192 PowerTags (RT 8192) | **6AV6 381-1BH06-2AX0** |
| • 65536 PowerTags (RT 65536) | **6AV6 381-1BF06-2AX0** |
| Incl. 512 archive tags each | |
| **Complete packages on CD-ROM** | |
| Language versions: DE/EN/FR/IT/ES; with license for | |
| • 128 PowerTags (RC 128) | **6AV6 381-1BM06-2AX0** |
| • 256 PowerTags (RC 256) | **6AV6 381-1BN06-2AX0** |
| • 1024 PowerTags (RC 1024) | **6AV6 381-1BP06-2AX0** |
| • 8192 PowerTags (RC 8192) | **6AV6 381-1BS06-2AX0** |
| • 65536 PowerTags (RC 65536) | **6AV6 381-1BQ06-2AX0** |
| Incl. 512 archive tags each | |

| | Order No. |
|---|---|
| ***SIMATIC WinCC system software V6.2*** | |
| **Runtime packages on CD-ROM** | |
| Language versions: English/simplified and traditional Chinese/Korean/Taiwanese/ Japanese; with license for | |
| • 128 PowerTags (RT 128) | **6AV6 381-1BC06-2AV0** |
| • 256 PowerTags (RT 256) | **6AV6 381-1BD06-2AV0** |
| • 1024 PowerTags (RT 1024) | **6AV6 381-1BE06-2AV0** |
| • 8192 PowerTags (RT 8192) | **6AV6 381-1BH06-2AV0** |
| • 65536 PowerTags (RT Max) | **6AV6 381-1BF06-2AV0** |
| Incl. 512 archive tags each | |
| **Complete packages on CD-ROM** | |
| Language versions: English/simplified and traditional Chinese/Korean/Taiwanese, Japanese; with license for | |
| • 128 PowerTags (RC 128) | **6AV6 381-1BM06-2AV0** |
| • 256 PowerTags (RC 256) | **6AV6 381-1BN06-2AV0** |
| • 1024 PowerTags (RC 1024) | **6AV6 381-1BP06-2AV0** |
| • 8192 PowerTags (RC 8192) | **6AV6 381-1BS06-2AV0** |
| • 65536 PowerTags (RC Max) | **6AV6 381-1BQ06-2AV0** |
| Incl. 512 archive tags each | |

## Ordering data (continued)

| | Order No. |
|---|---|
| **SIMATIC WinCC V6.2 PowerPacks** | |
| For upgrading from: | |
| **Runtime packages** | |
| • 128 to 256 PowerTags | **6AV6 371-1BD06-2AX0** |
| • 128 to 1024 PowerTags | **6AV6 371-1BE06-2AX0** |
| • 128 to 8192 PowerTags | **6AV6 371-1BK06-2AX0** |
| • 128 to 65536 PowerTags | **6AV6 371-1BF06-2AX0** |
| • 256 to 1024 PowerTags | **6AV6 371-1BG06-2AX0** |
| • 256 to 8192 PowerTags | **6AV6 371-1BL06-2AX0** |
| • 256 to 65536 PowerTags | **6AV6 371-1BH06-2AX0** |
| • 1024 to 8192 PowerTags | **6AV6 371-1BM06-2AX0** |
| • 1024 to 65536 PowerTags | **6AV6 371-1BJ06-2AX0** |
| • 8192 to 65536 PowerTags | **6AV6 371-1BN06-2AX0** |
| **Complete packages** | |
| • 128 to 256 PowerTags | **6AV6 371-1BD16-2AX0** |
| • 128 to 1024 PowerTags | **6AV6 371-1BE16-2AX0** |
| • 128 to 8192 PowerTags | **6AV6 371-1BK16-2AX0** |
| • 128 to 65536 PowerTags | **6AV6 371-1BF16-2AX0** |
| • 256 to 1024 PowerTags | **6AV6 371-1BG16-2AX0** |
| • 256 to 8192 PowerTags | **6AV6 371-1BL16-2AX0** |
| • 256 to 65536 PowerTags | **6AV6 371-1BH16-2AX0** |
| • 1024 to 8192 PowerTags | **6AV6 371-1BM16-2AX0** |
| • 1024 to 65536 PowerTags | **6AV6 371-1BJ16-2AX0** |
| • 8192 to 65536 PowerTags | **6AV6 371-1BN16-2AX0** |
| ***SIMATIC WinCC V6.2 Archive*** | |
| • 1500 archives | **6AV6 371-1DQ16-2AX0** |
| • 5000 archives | **6AV6 371-1DQ16-2BX0** |
| • 10000 archives | **6AV6 371-1DQ16-2CX0** |
| • 30000 archives | **6AV6 371-1DQ16-2EX0** |
| • 80000 archives | **6AV6 371-1DQ16-2GX0** |
| • 120000 archives | **6AV6 371-1DQ16-2JX0** |
| **SIMATIC WinCC V6.2 Archive PowerPacks** | |
| For upgrading archiving from: | |
| • 1500 to 5000 archive tags | **6AV6 371-1DQ16-2AB0** |
| • 5000 to 10000 archive tags | **6AV6 371-1DQ16-2BC0** |
| • 10000 to 30000 archive tags | **6AV6 371-1DQ16-2CE0** |
| • 30,000 to 80,000 archive tags | **6AV6 371-1DQ16-2EG0** |
| • 80000 to 120000 archive tags | **6AV6 371-1DQ16-2GJ0** |

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

| | | Order No. |
|---|---|---|
| **SIMATIC WinCC Upgrade/ Comprehensive Support** | | |
| **WinCC V6 Upgrade** [1] | | |
| For upgrading the RT version: | | |
| • from V5.x to V6.2 | E) | **6AV6 381-1AA06-2AX4** |
| • from V6.x to V6.2 | E) | **6AV6 381-1AA06-2AX3** |
| • from V5.x ASIA to V6.2 ASIA | E) | **6AV6 381-1AA06-2AV4** |
| • from V6.x ASIA to V6.2 ASIA | E) | **6AV6 381-1AA06-2AV3** |
| For upgrading the RC version: | | |
| • from V5.x to V6.2 | E) | **6AV6 381-1AB06-2AX4** |
| • from V6.x to V6.2 | E) | **6AV6 381-1AB06-2AX3** |
| • from V5.x ASIA to V6.2 ASIA | E) | **6AV6 381-1AB06-2AV4** |
| • from V6.x ASIA to V6.2 ASIA | E) | **6AV6 381-1AB06-2AV3** |
| **WinCC Comprehensive Support** [2] | | |
| contains current updates/upgrades for WinCC basic software und options: | | |
| • 1 license | | **6AV6 381-1AA00-0AX5** |
| • 3 licenses | | **6AV6 381-1AA00-0BX5** |
| • 10 licenses | | **6AV6 381-1AA00-0CX5** |
| ***SIMATIC WinCC documentation (to be ordered separately)*** | | |
| **SIMATIC WinCC V6 Communication Manual** | | |
| Communication manual for process communication and OPC communication from WinCC V6 | | |
| • German | | **6AV6 392-1CA06-0AA0** |
| • English | | **6AV6 392-1CA06-0AB0** |
| ***SIMATIC WinCC communication*** | | |
| ***Communication via Industrial Ethernet*** | | |
| **SOFTNET-S7 Edition 2006** | | |
| Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 64 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; for CP 1512 and CP 1612 German/English | | |
| • Single license for 1 installation | | **6GK1 704-1CW64-3AA0** |
| • Upgrade package | | **6GK1 704-1CW64-3AE0** |

1) In accordance with license stipulations, 1 upgrade package must be ordered for each WinCC station.

2) Comprehensive support runs for one year. The contract is automatically extended by a further year unless canceled 3 months prior to expiry. In accordance with license stipulations, 1 comprehensive support package must be ordered for each WinCC station.

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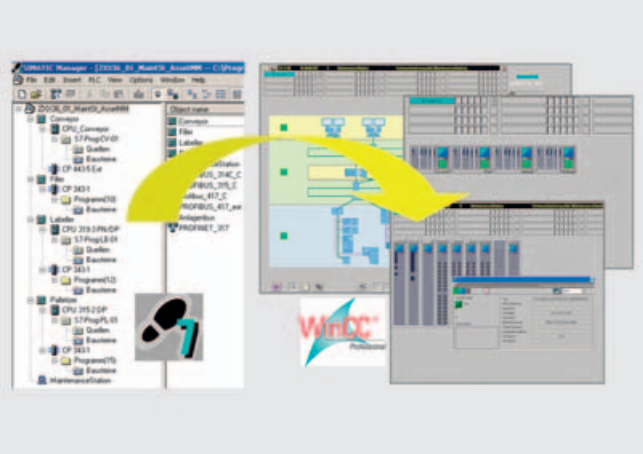
## Ordering data (continued)

| | | Order No. |
|---|---|---|
| **SOFTNET-S7 Lean Edition 2006 (included in the scope of supply of WinCC V6.2)** | | |
| Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 8 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server, for CP 1512 and CP 1612 German/English | | |
| • Single license for 1 installation | | **6GK1 704-1LW64-3AA0** |
| • Upgrade package | | **6GK1 704-1LW64-3AE0** |
| **CP 1613 A2** | A) | **6GK1 161-3AA01** |
| PCI card (32 bits) for connecting a PG/PC to Industrial Ethernet (communications software must be ordered separately) | | |
| **S7-1613 Edition 2006** | | |
| Software for S7 and S5 communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, Windows 2000 Professional/Server; for CP 1613/CP 1613 A2 German/English | | |
| • Single license for 1 installation | | **6GK1 716-1CB64-3AA0** |
| • Upgrade package | | **6GK1 716-1CB64-3AE0** |
| **TF-1613 2006** | | **6GK1 716-1TB64-3AA0** |
| Software for TF protocol, S5-compatible communication incl. OPC, PG/OP communication (S5/505 Layer 4 communication with TCP/IP), for Windows XP Professional/ 2003 Server/ 2000 Professional/Server | | |
| ***Communication via PROFIBUS*** | | |
| **CP 5611 A2** | A) | **6GK1 561-1AA01** |
| PCI card (32-bit) for connecting a PG/PC to PROFIBUS (communications software included in the WinCC basic package) | | |
| **CP 5611 MPI** | A) | **6GK1 561-1AM01** |
| Comprising CP 5611 A2 (32-bit) and MPI cable, 5 m | | |
| **CP 5512** | | **6GK1 551-2AA00** |
| PCMCIA card (CARDBUS 32-bit) for connecting a PG/Notebook to PROFIBUS or MPI (communications software included in the WinCC basic package) | | |
| **PC/MPI adapter** | | **6ES7 972-0CA23-0XA0** |
| RS 232, 9-pin; male with RS 232/MPI converter, max. 19.2 kbit/s | | |
| **CP 5613 A2** | | **6GK1 561-3AA01** |
| PCI card (32-bit) for connecting a PC to PROFIBUS (communications software must be ordered separately). | | |
| **S7-5613 Edition 2006** | | |
| Software for S7 communication incl. PG/OP protocol, OPC server, for 32 bit Windows XP Professional, 2003 Server, 2000 Professional/Server; English/German | | |
| • Single license for 1 installation | | **6GK1 713-5CB64-3AA0** |
| • Upgrade package | | **6GK1 713-5CB64-3AE0** |
| **DP-5613 Edition 2006** | | |
| Software for DP protocol incl. PG/OP communication, FDL, DP OPC server, for 32 bit Windows XP Professional, 2003 Server, 2000 Professional/Server; English/German | | |
| • Single license for 1 installation | | **6GK1 713-5DB64-3AA0** |
| • Upgrade package | | **6GK1 713-5DB64-3AE0** |
| **FMS-5613 Edition 2006** | | |
| Software for FMS protocol incl. PG/OP communication, FDL, FMS OPC server, for 32 bit Windows XP Professional, 2003 Server, 2000 Professional/Server; English/German | | |
| • Single license for 1 installation | | **6GK1 713-5FB64-3AA0** |
| • Upgrade package | | **6GK1 713-5FB64-3AE0** |
| ***Hardware for control technology functions*** | | |
| **DCF-77 receiver** | | |
| for time synchronization | | |
| • DCF77 (Europe) | | **2XV9 450-1AR14** |
| • GPS (world-wide) | I) | **2XV9 450-1AR13** |
| **Multi-VGA** | | |
| • 2 screens | A) | **6ES7 652-0XX03-1XE0** |
| • 4 screens | A) | **6ES7 652-0XX03-1XE1** |
| **Chip card reader** | | **6ES7 652-0XX01-1XC0** |
| **Chip card for chip card reader** | | **6ES7 652-0XX05-1XD1** |
| (10 units in the package) | | |

A) Subject to export regulations: AL: N and ECCN: EAR99H
I) Subject to export regulations: AL: N and ECCN: 7A994

**Note:**
For further information on control technology options see Catalog ST PCS 7.

## Overview



### *System-integrated plant asset management system*

- Automatic generation of a maintenance view in WinCC from the STEP 7 hardware configuration
- Plant-wide visualization of all automation components from the management level to the field level in ready linked, hierarchically arranged WinCC displays
- Display of central and distributed SIMATIC S7 components, PROFIBUS and PROFINET networks as well as associated bus nodes
- Ethernet network components and industrial PCs can be integrated through SIMATIC NET SNMP OPC Server
- Display of device status with group status generation in overview and detail displays
- The device statuses "Maintenance required" and "Maintenance request" are supported for status-based maintenance
- Provision of uniform faceplates showing detailed information for all components displayed
- Display of the device identification data (electronic rating plate)
- Submission of maintenance requests directly from WinCC
- Integrated display of the status of the request



## Technical specifications

### *Hardware requirements*

| System | Clock frequency | Main memory | Free hard disk space |
|---|---|---|---|
| Engineering station | 2.8 GHz | 1 GB | 15 GB |
| Maintenance Station Stand-alone / WinCC-Station "Single-user Workstation" | 2.8 GHz | 1 GB | 15 GB |
| Maintenance Station Server / WinCC Server | 2.8 GHz | 1 GB | 15 GB |
| Maintenance Station Client / WinCC Client | 2.8 GHz | 512 MB | 3 GB |

### *Software requirements*

| System | Operating system |
|---|---|
| Engineering station "ES" | Windows XP Professional SP2<br>Windows Server 2003 SP1 |
| Maintenance Station Stand-alone / WinCC-Station "Single-user Workstation" | Windows XP Professional SP2<br>Windows Server 2003 SP1 |
| ES with Maintenance Station Stand-alone | Windows XP Professional SP2<br>Windows Server 2003 SP1 |
| Maintenance Station Server / WinCC Server | Windows Server 2003 SP1 |
| Maintenance Station Client / WinCC Client | Windows XP Professional SP2<br>Windows Server 2003 SP1 |

## Technical specifications (continued)

### *Requirements for the integration of devices*

| Type | Integration | Comment |
|---|---|---|
| **SIMATIC S7 controllers / I/O** | | |
| • S7-300 [1] | Yes | |
| • S7-400 | Yes | |
| • WinAC | Yes | |
| **Distributed devices** | | |
| • ET 200 | Yes | PROFIBUS DP and PROFINET IO according to STEP 7 hardware catalog |
| • PROFIBUS standard slaves | Yes | Integration using a GSD file |
| • PROFINET standard devices | Yes | Integration using a GSD file |
| **Network components** | | |
| Ethernet network components | Yes | SIMATIC NET SNMP OPC Server and MIB also required |
| PROFINET network components | Yes | |
| PROFIBUS diagnostic repeater | Yes | |
| **Personal Computer** | | |
| PC/Industrial PC | Yes | SIMATIC NET SNMP OPC Server also required |
| **Drives** | | |
| Drives with PROFIBUS connection | Yes | For integrating devices designed to the PROFIDRIVE profile, Drive ES SIMATIC (V5.4 SP1 or higher) is required |
| Drives with PROFINET connection | Yes | For integrating devices designed to the PROFIDRIVE profile, Drive ES SIMATIC (V5.4 SP1 or higher) is required |
| **Accessory devices** | | |
| Devices not configured in STEP 7 Hardware Config | Yes | Integrated via function block (asset proxy) |

1) With S7-300, PROFIBUS/PROFINET systems are supported if they are connected to the internal CPU interfaces

## Ordering data

| | | Order No. |
|---|---|---|
| **SIMATIC Maintenance Station 2007 SP1**<br>Software for implementation of a plant-oriented asset management system | | |
| Basic package with engineering software (Floating License) and Runtime License for 100 devices | D) | **6ES7 840-0WD00-0YA0** |
| Powerpack 100 Runtime License for 100 additional devices | D) | **6ES7 840-0WD10-0YD0** |
| Powerpack 500 Runtime License for 500 additional devices | D) | **6ES7 840-0WD20-0YD0** |
| Powerpack 1000 Runtime License for 1000 additional devices | D) | **6ES7 840-0WD30-0YD0** |
| Update from Version 2007 to Version 2007 SP1 | D) | **6ES7 840-0WD00-0YE0** |
| Basic demo package 2007 SP1 | D) | **6ES7 840-0WD00-0YA7** |

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

## Overview


- Contains the most important engineering and runtime software packages for SIMATIC S7/C7, SIMATIC HMI, SIMATIC NET and SINUMERIK on one data medium (DVD)
- Permits the simultaneous, automatic installation of several software packages
- Permits the automatic updating of installed software packages
- Considerably reduces installation costs
- With specific setup for general settings, e.g. languages to be installed, installation paths etc.

*Note:*
The Premium Studio does not contain any licenses. These must be ordered separately, either by means of existing licenses for the corresponding version or by the separate ordering of new licenses.

## Ordering data

| | | Order No. |
|---|---|---|
| **Premium Studio 2007** | | |
| *Task:*<br>Installation/updating of software packages for engineering and runtime for SIMATIC S7/C7, SIMATIC HMI, SIMATIC NET and SINUMERIK;<br>without licenses;<br>*Target system:*<br>Windows XP Professional<br>*Requirements:*<br>PCU, S7-300/-400, C7<br>*Delivery form:*<br>on DVD; without licenses for the software packages | | |
| DVD | E) | **6ES7 815-8CD04-0YA7** |
| Software Update Service | E) | **6ES7 815-8CD00-0YL7** |

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

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# ADDM - Data Management

## Overview

With ADDM, you are completely in control of the SIMATIC and SINUMERIK controls – around the clock and with any program version. This tool is indispensable in a modern production area and ensures user-friendly backup, comparison and management of control data.

## Ordering data

| | | Order No. |
|---|---|---|
| **ADDM** | | |
| Software package | | |
| Languages: English, German | | |
| **ADDM Single User** | | |
| • Single license with CD-ROM of current software version | G) | **6BQ3030-1AA30-3AC0** |
| • Trial license with CD-ROM of current software version | E) | **6BQ3030-1AA70-3AC0** |
| • Single user upgrade | G) | **6BQ3030-1AB13-3AC0** |
| **ADDM Client** | | |
| • Single license without data carrier | G) | **6BQ3030-1AA20-1AC0** |
| • Single license with CD-ROM of current software version | G) | **6BQ3030-1AA10-0AC0** |
| • Client upgrade from V5.x to V6.1 with CD-ROM | G) | **6BQ3030-1AB11-3AC0** |
| **ADDM Server** | | |
| • Single license with CD-ROM of current software version | G) | **6BQ3030-1AA00-3AC0** |
| • Server upgrade from V5.x to V6.1 with CD-ROM | G) | **6BQ3030-1AB10-3AC0** |
| **ADDM Agent** | | |
| • Single license without data carrier | G) | **6BQ3030-1AA00-1AB0** |
| • Single license with CD-ROM of current software version | G) | **6BQ3030-4AA00-0AC0** |
| • Agent upgrade from V1.x to V1.2 with CD-ROM | G) | **6BQ3030-1AB12-3AC0** |

E) Subject to export regulations: AL: N and ECCN: EAR99S
G) Subject to export regulations: AL: N and ECCN: 5D992B2

# 8

# Programming Devices



***Brochures***

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

# Field PG M

## Overview

- The mobile, industry-compatible programming device with the powerful Intel Pentium M processor.
- It is ideal for start-up, servicing and maintaining automation systems.
- Industrial notebook with wireless technology, large display, slow battery discharge, high-speed RAM and integrated data backup concept.
- With all the usual interfaces for industrial applications.

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

## Technical specifications

| | SIMATIC Field PG M |
|---|---|
| **General features** | |
| Format | Notebook |
| Processor | Pentium Mobile 1.6 GHz or 2.0 GHz Dothan processor; Intel Mobile chipset 915 GM |
| Main memory | 1 GB DDR2 memory with 533 MHz front side bus |
| Free slots for expansions | PC card/PCMCIA: 1 x Type III or 2 x Type I |
| Graphics | Intel GMA 900 with DualView (e.g. desktop with 2 screens) |
| Display | 15" display; resolution XGA (1024 x 768) or SXGA+ (1400 x 1050) |
| Loudspeaker | Built-in stereo loudspeaker |
| Pointing device | Touch pad |
| Operating system | Windows XP Prof. SP2 Engl. MUI (Eng, Ger, Fr, Sp, It; additional languages can be installed later) |
| Power supply | Wide input range power supply 100-240 V, 50-60 Hz, high-performance lithium-ion rechargeable battery 73 Wh (runtime in excess of 4 hours) |
| Warranty conditions | 24 months for hardware components (6 months for battery) |
| *Drives* | |
| Hard disk | Serial ATA with 60 GB or 100 GB; easy to swap |
| DVD/CD | DVD ROM /CD RW or multi-standard DVD RW / CD RW |
| Disk drive | 1.44 MB; 3.5" |

| | SIMATIC Field PG M |
|---|---|
| *Interfaces* | |
| PROFIBUS DP/MPI | CP 5611-compatible |
| COM 1 | V.24/TTY (for SIMATIC S5); over supplied adapter on 9-pin Sub-D male connector |
| Programming interface | For memory cards, micro memory cards and S5 EPROM modules (over supplied adapter) |
| Ethernet | 10/100 Mbit/s Fast Ethernet |
| USB 2.0 | 2 x 2 (1 A/pair) |
| PC card (PCMCIA) | 1 x Type III or 2 x Type II |
| VGA | 1 x (for connecting an external monitor) |
| Parallel (LPT) | ECP |
| WLAN[1)] | Integrated, IEEE802.11 a,b,g |
| Modem | Analog, V.92 compatible |
| Headphones | 1 x (stereo) |
| Microphone | 1 x (stereo) |
| *Environmental conditions* | |
| Degree of protection to EN 60529 | Front IP30 with device closed |
| Vibrations | Tested acc. to DIN IEC 68-2-6 |
| • Operation | 10 … 58 Hz: 0.01875 mm, 58 … 500 Hz: 4.9 $m/s^2$ |
| • Transport | 5 … 9 Hz: 3.5 mm, 9 … 500 Hz: 9.8 $m/s^2$ |
| Shock | Tested acc. to DIN IEC 68-2-29 |
| • Operation | 50 $m/s^2$, 30 ms, 100 shocks |
| • Storage/transport | 250 $m/s^2$, 6 ms, 1000 shocks |

1) The integrated wireless LAN (2.4 GHz band) and modem is approved for operation in Europe. In the 5 GHz band, the wireless LAN is approved for operation in Germany, France, Italy, Spain, UK and Austria. An optionally selectable, integrated wireless LAN module has been approved for operation in the USA and China. If used in other countries, please note the stipulations of those particular countries. For the USA and China, a WLAN module with UL, FCC and CCC approval is available as an option.

## Technical specifications (continued)

| | SIMATIC Field PG M |
|---|---|
| Electromagnetic compatibility (EMC) | |
| • Interference emission | EN 55022 Class B |
| • Immunity to line-conducted interference on the supply cables | ± 2 kV (acc. to IEC 1000-4-4; 1995; burst)<br>± 1 kV (acc. to IEC 1000-4-5; 1995; symm. surge)<br>± 2 kV (acc. to IEC 1000-4-5; 1995; unsymm. surge) |
| • Interference immunity on signal lines | ± 1 kV (acc. to IEC 1000-4-4; 1995; burst; length < 3 m)<br>± 2 kV (acc. to IEC 1000-4-4; 1995; burst; length > 3 m)<br>± 1 kV (acc. to IEC 1000-4-4; 1995; symm. surge; length > 3 m)<br>± 2 kV (acc. to IEC 1000-4-4; 1995; unsymm. surge, length > 3 m) |
| • Immunity to electrostatic discharges | ± 4 kV contact discharge (acc. to IEC 1000-4-2: 1995)<br>± 8 kV air discharge (acc. to IEC 1000-4-2: 1995) |
| • Immunity to high-frequency irradiation | 10 V/m; 80 … 1000 MHz; 80% AM (acc. to ENV 50140: 1993)<br>10 V/m; 900 MHz; 50% ED (acc. to ENV 50204: 1995) |
| • Immunity to high-frequency emissions | 10 V; 9 kHz … 80 MHz |
| • Immunity to magnetic fields | 30 A/m; 50 Hz |

| | SIMATIC Field PG M |
|---|---|
| Temperature | Tested acc. to DIN EN 60068-2-2: 1994, DIN IEC 68-2-1, DIN IEC 68-2-14 |
| • Operation[2)] | +5 … +40 °C |
| • Storage/transport | -20 … +60 °C |
| • Gradient, max. | 10 °C/h (no dewing) |
| Relative humidity | Tested acc. to DIN IEC 68-2-3, DIN IEC 68-2-30, DIN IEC 68-2-56 |
| • Operation | 5% … 80% at 25 °C (no dewing) |
| • Storage/transport | 5% … 95% at 25 °C (no dewing) |
| *Dimensions and weights* | |
| Dimensions (W x H x D) in mm | 330 x 300 x 52 |
| Weight, approx. | 3,9 kg |

2) Battery charging and CD/DVD writing is only possible at temperatures up to 35 °C

## Ordering data

| | | Order No. |
|---|---|---|
| **Programming device Field PG M** | | |
| Field PG standard: 1.6 GHz Pentium M processor (730), DVD ROM/CD-RW combined drive, 15" XGA display (1024x768), 60 GB serial ATA hard disk, 1x1 GB DDR2 RAM | D) | **6ES7 712-0AA0■-0■■5** |
| Field PG Premium: 2 GHz Pentium M processor (760), Dual Layer Multi Standard DVD-RW, 15" SXGA+ display (1400x1050), 100 GB serial ATA hard disk, 1x1 GB DDR2 RAM | D) | **6ES7 712-1BB1■-0■■5** |
| Power cable (required) | | |
| • for Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland; Keyboard: International (& German); WLAN module with CE | | **0** |
| • For Great Britain; Keyboard: International (& German); WLAN module with CE | | **1** |
| • For Switzerland; Keyboard: International (& German); WLAN module with CE | | **2** |

| | | Order No. |
|---|---|---|
| **Programming device Field PG M** | | |
| Field PG standard: | D) | **6ES7 712-0AA0■-0■■5** |
| Field PG Premium: | D) | **6ES7 712-1BB1■-0■■5** |
| • for the USA, Japan; Keyboard: International (& German); WLAN module with UL, FCC, CCC (no CE) | | **3** |
| • For Italy; Keyboard: International (& German); WLAN module with CE | | **4** |
| • for Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland; keyboard: French (AZERTY) with country-specific labeling for France, Belgium, Switzerland; WLAN module with CE | | **5** |
| • For Switzerland; Keyboard: French (AZERTY) with country-specific labeling for France, Belgium, Switzerland; WLAN module with CE | | **6** |

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

## Field PG M

### Ordering data (continued)

| | | Order No. |
|---|---|---|
| **Programming device Field PG M** | | |
| Field PG standard: | D) | **6ES7 712-0AA0■-0■■5** |
| Field PG Premium: | D) | **6ES7 712-1BB1■-0■■5** |
| Operating system | | |
| • Windows XP English MUI (Fr, Sp, It, Ger; stored on HD as image) | | **A** |
| • Windows 2000 English MUI (Fr, Sp, It, Ger; stored on HD as image) | | **B** |
| • Windows 2000 German (Fr, Sp, It, En; stored on HD as image) | | **C** |
| Licenses for the SIMATIC software | | |
| • Trial license for STEP 7 Professional, WinCC flexible Advanced | | **A** |
| • Upgrade license for STEP 7, STEP 5, WinCC flexible Advanced (requires STEP 7/ STEP 5 license (V3.0 or higher)) | | **B** |
| • Upgrade license for STEP 7 Professional, STEP 5, WinCC flexible Advanced (requires license for STEP 7 Professional / STEP 5 (1/2000 or later)) | | **C** |
| • License for STEP 7, STEP 7 Micro/WIN, WinCC flexible Advanced | | **D** |
| • License STEP 7, STEP 5, STEP 7-Micro/WIN, WinCC flexible Advanced; incl. EPROM adapter and S5-CC cable | | **E** |
| • License for STEP 7 Professional, STEP 7 Micro/WIN, WinCC flexible Advanced | | **F** |
| • License STEP 7 Professional, STEP 5, STEP 7-Micro/WIN, WinCC flexible Advanced; incl. EPROM adapter and S5-CC cable | | **G** |

1) The capacity of the battery decreases for technological reasons with each charging/discharging operation and also as the result of being stored at excessively high or low temperatures. The running time per charge decreases therefore in the course of time. In normal use the battery can be charged and discharged over a period of six months from when the field PG is purchased.
Capacity loss is not covered by the warranty. For the battery's operation we grant a warranty of six months. We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

| | | Order No. |
|---|---|---|
| **Accessories** | | |
| **Memory expansion** | | |
| 512 MB DDR2-RAM 533 | A) | **6ES7 648-2AG30-0GA0** |
| 1 GB DDR2-RAM 533 | A) | **6ES7 648-2AG40-0GA0** |
| **USB mouse (PS/2-compatible)** | A) | **6ES7 790-0AA01-0XA0** |
| **AC/DC external power supply unit** | | **6ES7 798-0GA00-0XA0** |
| **Power cable** | | |
| for Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland | | **6ES7 900-5AA00-0XA0** |
| For Great Britain | | **6ES7 900-5BA00-0XA0** |
| For Switzerland | | **6ES7 900-5CA00-0XA0** |
| For USA | | **6ES7 900-5DA00-0XA0** |
| For Italy | | **6ES7 900-5EA00-0XA0** |
| **Spare battery (lithium ion, 6.6 Ah)1)** | | **6ES7 798-0AA05-0XA0** |
| **MPI cable** | | **6ES7 901-0BF00-0AA0** |
| for connecting a PG and SIMATIC S7 via MPI; 5 m | | |
| **S5 EPROM programming adapter** | | **6ES7 798-0CA00-0XA0** |
| for SIMATIC S5 EPROM programming using the Field PG | | |
| **S5 PLC cable** | | **6ES5 734-2BF00** |
| For connecting programming devices to SIMATIC S5 PLCs, 5 m | | |
| **Hard disk kit** | A) | **6ES7 791-2BA00-0AA0** |
| Swappable hard disk 100 GB serial ATA; with protective pocket and Torx screwdriver | | |
| **Adapter serial ATA to USB** | A) | **6ES7 790-1AA00-0AA0** |
| For using the removable hard disk of the hard disk kit as an external hard disk (only for Field PG M) | | |
| **Rucksack for Field PG** | | **6ES7 798-0DA00-0XA0** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1

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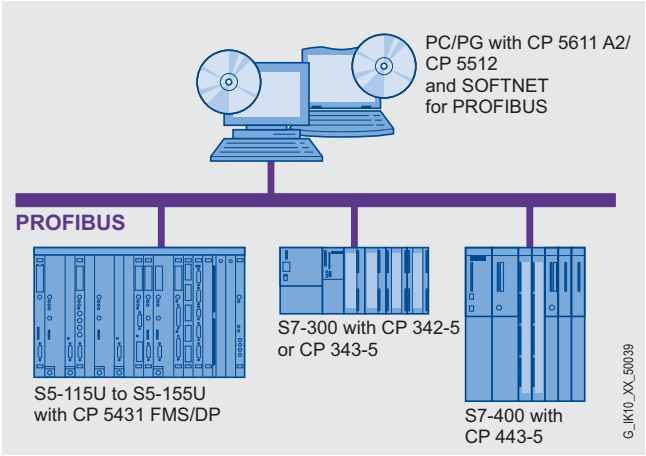
## Overview




| DP-M | DP-S | PG | S7 | S5 | FMS | OPC |
|---|---|---|---|---|---|---|
| ■ | ■ | ■ | ■ | ■ | | ■ |

- Software for coupling PCs/programming devices and notebooks to automation controllers
- Can be used together with CP 5512 (PC card, CardBus 32-bit), CP 5611 A2 (PCI) and integral PROFIBUS interface of the SIMATIC PG/PC
- Communication services:
  - PROFIBUS DP Master Class 1 and 2 with acyclic expansions
  - PROFIBUS DP Slave
  - PG/OP communication
  - S7 communication
  - S5-compatible communication (SEND/RECEIVE based on the FDL interface)
- The appropriate OPC servers are included in the scope of supply of the respective communication software

## Technical specifications

| Performance data | CP 5511 [2] | CP 5611 A2/ CP 5512 |
|---|---|---|
| Mono protocol mode | | |
| Number of connectable DP slaves | ≤ 32 [1] | max. 60 |
| Number of FDL tasks waiting | max. 32 | max. 100 |
| Number of PG/OP and S7 connections | max. 8 | max. 8 |
| • DP master | DP-V0, DP-V1 with SOFTNET-DP | |
| • DP slave | DP-V0, DP-V1 with SOFTNET-DP slave | |

1) Depends on memory available in the adapter area of the notebook
2) Predecessor module (16-bit PCMCIA) is no longer available

## Ordering data

| | Order No. |
|---|---|
| **SOFTNET-S7 Edition 2006** | |
| Software for S7 communication incl. FDL protocol with OPC server and NCM PC; runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows 2000 Professional/Server, Windows XP Professional, 2003 Server, for CP 5512, CP 5611 A2 German/English | |
| • Single license for 1 installation | **6GK1 704-5CW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-5CW00-3AL0** |
| **SOFTNET-DP Edition 2006** | |
| Software for DP protocol (Master Classes 1 and 2), incl. FDL protocol with OPC server and NCM PC; runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows 2000 Professional/Server, Windows XP Professional, 2003 Server, for CP 5512, CP 5611 German/English | |
| • Single license for 1 installation | **6GK1 704-5DW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-5DW00-3AL0** |
| **SOFTNET-DP Slave Edition 2006** | |
| Software for DP slave incl. DP OPC server and NCM PC; runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows 2000 Professional/Server, Windows XP Professional, 2003 Server, for CP 5512, CP 5611 A2 German/English | |
| • Single license for 1 installation | **6GK1 704-5SW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-5SW00-3AL0** |

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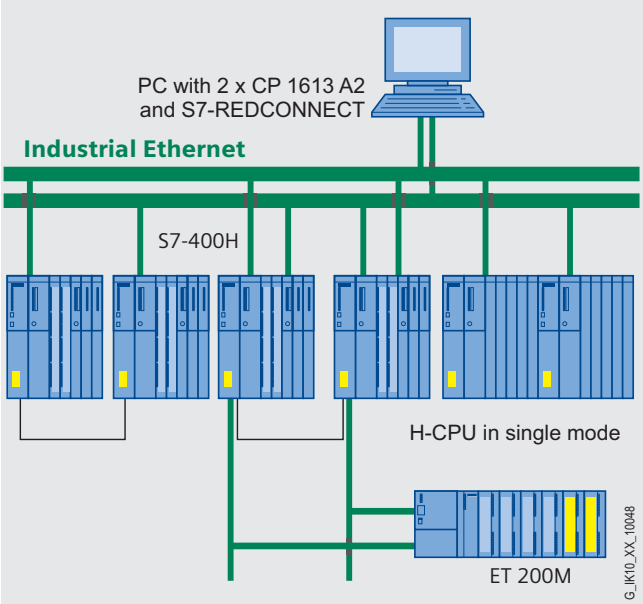
## S7-REDCONNECT

### Overview

- For connecting PCs over redundant Industrial Ethernet to the SIMATIC S7-400H
- Protected from communication failures arising from a fault in the double bus or in redundant rings
- For redundantly configured Industrial Ethernet
- Can also be implemented in non-redundant networks
- No additional programming overhead for the PC and in H systems
- The appropriate OPC server and configuration tools are included in the scope of supply of the respective communication software
- Enhanced redundancy over 4-way communication (STEP 7 V5.1 + SP4 and higher)




System configuration for S7-REDCONNECT

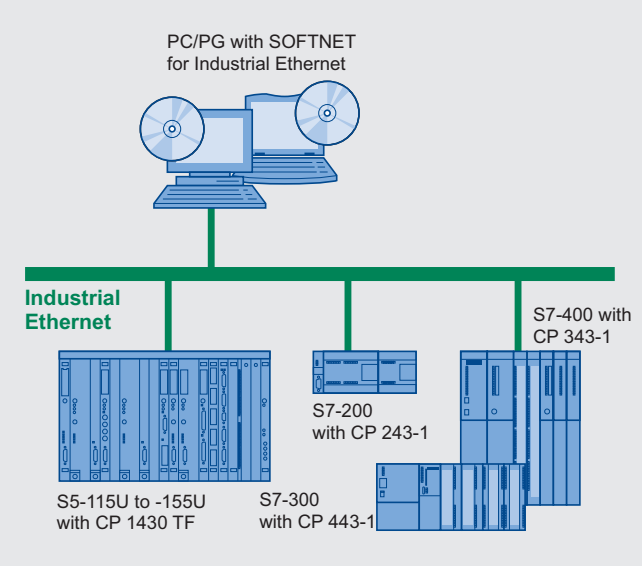
| PN | ISO | TCP/IP | UDP | OPC | PG | S7 | S5 | IT | FTP |
|---|---|---|---|---|---|---|---|---|---|
| | ■ | | | ■ | ■ | ■ | | | |

### Ordering data

| | Order No. |
|---|---|
| **S7-REDCONNECT Edition 2006**<br>Software for fail-safe S7 communication over redundant networks incl. S7-OPC server, S7-1613 2006, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; for CP 1613/CP 1613 A2 German/English | **6GK1 716-0HB64-3AA0** |
| • Single license for 1 installation | **6GK1 716-0HB64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: Current software version | **6GK1 716-0HB00-3AL0** |
| • Upgrade to Version 2006 | **6GK1 716-0HB64-3AE0** |
| **Power Pack S7-REDCONNECT Edition 2006**<br>For expanding S7-1613 2006 to S7-REDCONNECT, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, Windows 2000 Professional/Server; for CP 1613/CP 1613 A2 German/English | **6GK1 716-0HB64-3AC0** |

## Overview

- For coupling programming devices/PCs/workstations to programmable controllers
- Communication services:
  - PG/OP communication
  - S7 communication
  - S5-compatible communication (SEND/RECEIVE)
- Can be used with
  - Layer 2 Ethernet card (PCI)
  - CP 7515 (PC Card CardBus)
  - Integrated Industrial Ethernet interface
  - Modem (Remote Access Service RAS)
- Complete protocol stack as a software package
- The appropriate OPC server and configuration tools are included in the scope of supply of the respective communication software




System configuration SOFTNET for Industrial Ethernet

| PN | ISO | TCP/IP | UDP | OPC | PG | S7 | S5 | IT | FTP |
|---|---|---|---|---|---|---|---|---|---|
| | ■ | ■ | | ■ | | | | | |

## Technical specifications

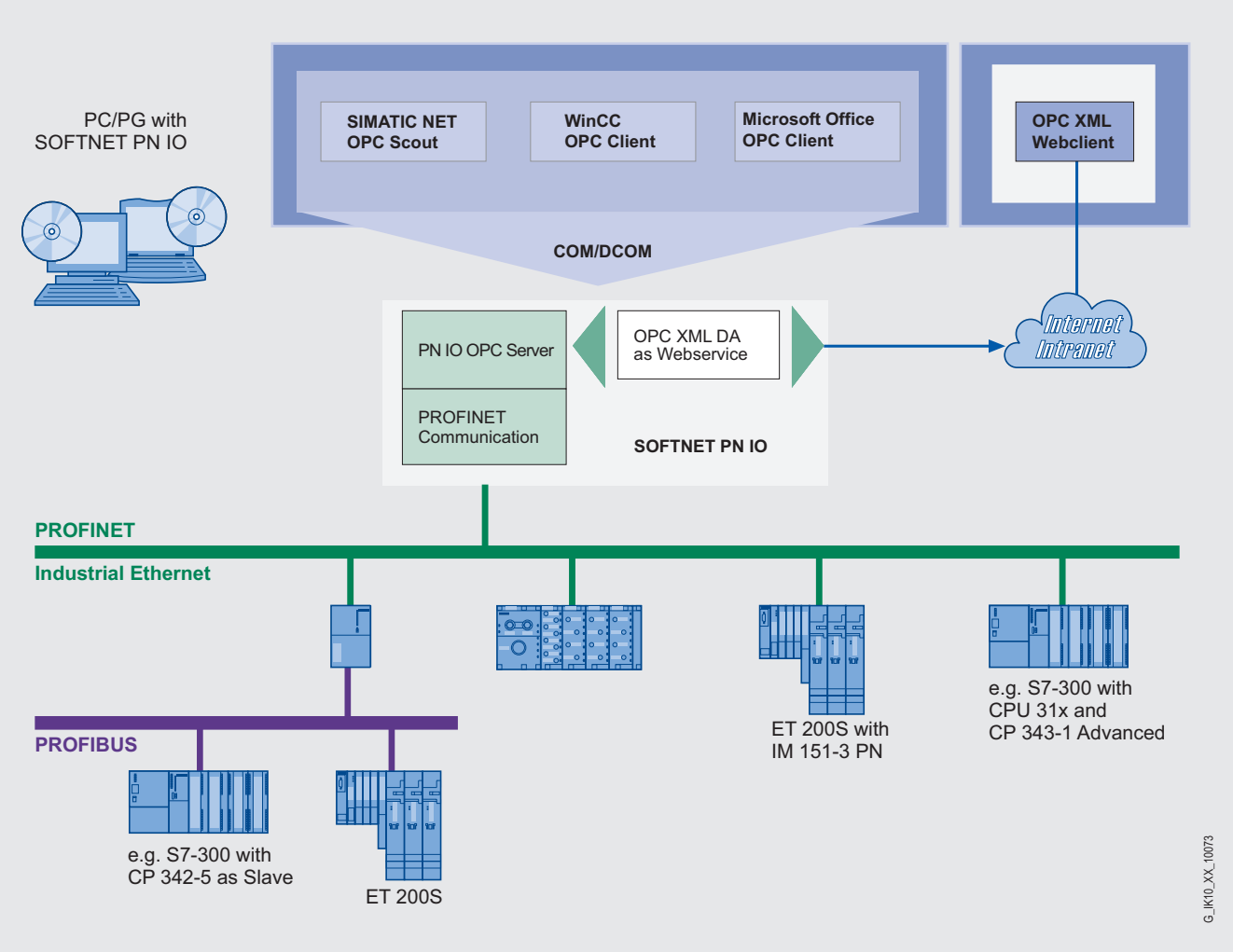
| Performance data | |
|---|---|
| S7 and PG/OP communication (number of operable connections) | |
| • SOFTNET-S7 | Max. 64 |
| • SOFTNET-S7 Lean | Max. 8 |

## Ordering data

| | Order No. |
|---|---|
| **SOFTNET-S7 Edition 2006 for Industrial Ethernet** | |
| Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 64 connections, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1CW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1CW00-3AL0** |
| • Upgrade from V6.0 to 2006 edition | **6GK1 704-1CW64-3AE0** |
| **SOFTNET-PG Edition 2006 for Industrial Ethernet** | |
| Software for PG/OP communication, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1PW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1PW00-3AL0** |
| • Upgrade from V6.0 to 2006 edition | **6GK1 704-1PW64-3AE0** |
| **SOFTNET-S7 Lean Edition 2006 for Industrial Ethernet** | |
| Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 8 connections, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 704-1LW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1LW00-3AL0** |
| • Upgrade from V6.0 to 2006 edition | **6GK1 704-1LW64-3AE0** |

# SOFTNET PN IO

## Overview




PC with SOFTNET PN IO as PROFINET IO Controller

| PN | ISO | TCP/IP | UDP | OPC | PG | S7 | S5 | IT | FTP |
|---|---|---|---|---|---|---|---|---|---|
| ■ | | ■ | | ■ | | | | | |

- Software with PROFINET IO Controller function for coupling PG/PC and IPC with PROFINET IO Devices
- Possible applications:
  - PC-based control systems
  - HMI systems
  - test applications
- Communication services:
  - PROFINET IO Controller
- Can be used with
  - integrated interfaces of SIMATIC PG/PC
  - you can find more information about the environment of use at www.siemens.com/simatic-net/ik-info
- Cost-effective solution for the low-end performance range
- OPC server for I/O interfacing over PROFINET included in scope of supply

## Technical specifications

| | SOFTNET PN IO |
|---|---|
| **Performance data** | |
| • Number of operable IO devices | |
| • Number of external IO-lines in one central rack | max. 64 |
| • Size of IO data areas overall | max. 1 |
| - I/O input area | |
| - I/O output area | max. 2 KB |
| • Size of I/O data area per connected I/O device | max. 2 KB |
| - I/O input area | |
| - I/O output area | max. 1440 byte |

## Ordering data

| | Order No. |
|---|---|
| **SOFTNET PN IO Edition 2006** | |
| Software for PROFINET I/O controller with OPC server and NCM PC; runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 server; Windows 2000 Professional, German/English | |
| • Single license for one installation | **6GK1 704-1HW64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 704-1HW00-3AL0** |

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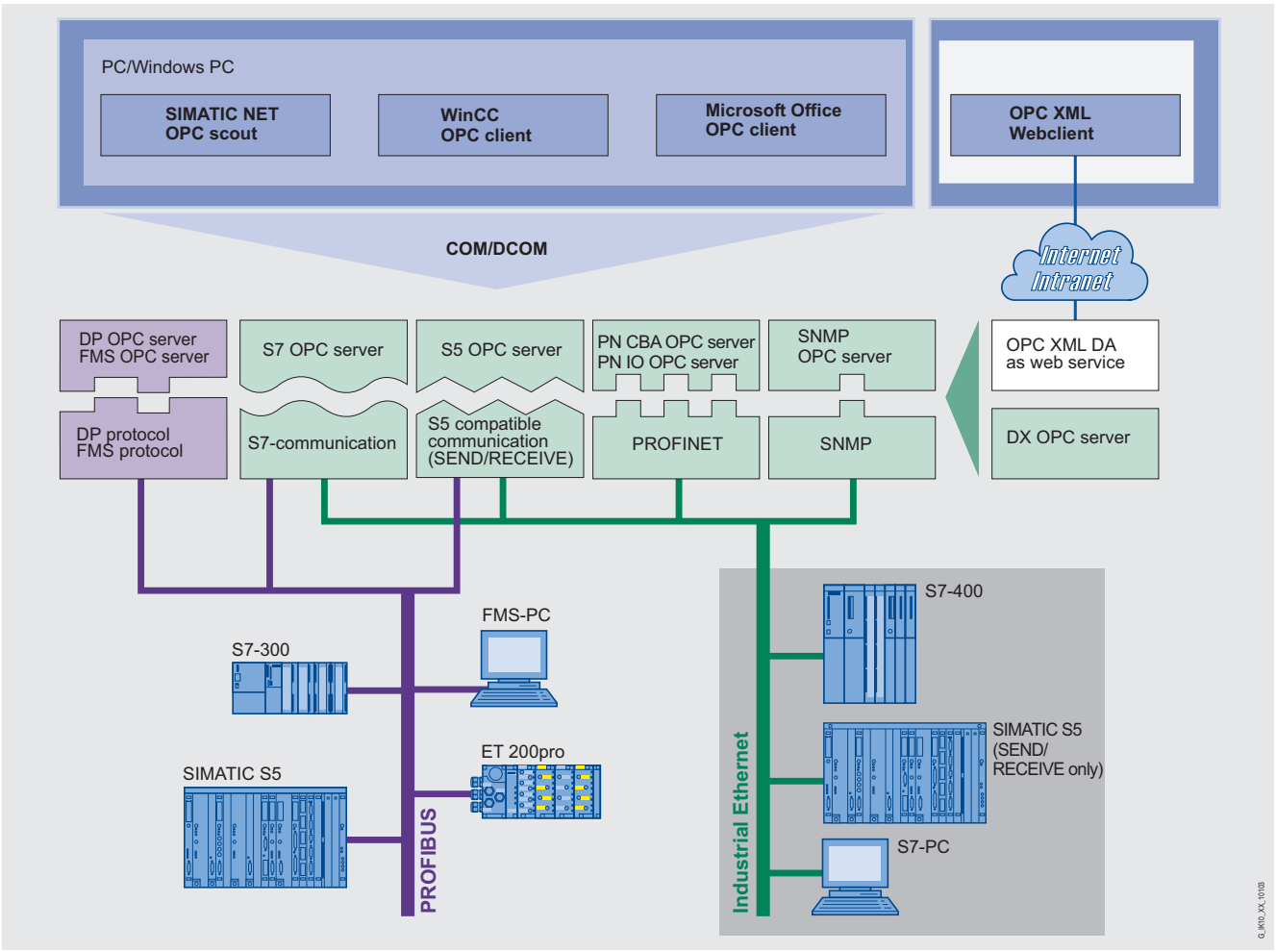
## OPC server for Industrial Ethernet

### Overview

- The appropriate OPC servers are included in the scope of supply of the respective communication software
- Standardized, open, manufacturer-independent interface
- Interfacing of OPC-capable Windows applications to S7-communication and S5-compatible communication functions (SEND/RECEIVE), PROFINET and SNMP
- OPC Scout with browser functions as OPC client and OCX Data Control




System integration with the OPC server

## Technical specifications

| | |
|---|---|
| Programming | • Synchronous and asynchronous reading and writing of variables<br>• Monitoring of variables using the OPC server with a signal to the client when a change occurs<br>• Use of quantity operations; so a large amount of data can be processed in a short time. |
| Interfaces | • Custom Interface (C++, .NET) for high OPC performance<br>• Automation Interface (VB, Excel, Access, Delphi, ...) for ease-of-use<br>• Graphics with OCX for configuring instead of programming<br>• OPC XML-Interface for Data Access<br>• DX interface with methods for controlling the runtime behavior of the DX OPC server. |

| **Products** | **include OPC servers for:** |
|---|---|
| Industrial Ethernet | |
| • S7-1613, SOFTNET-S7 for Industrial Ethernet, SOFTNET-S7 Lean | S7-OPC server for S7 communication, XML-DA |
| | S5-OPC server for S5 compatible communication, XML-DA |
| | SNMP OPC server for SNMP protocol access; XML-DA |
| PROFINET | |
| • SOFTNET PN IO | PN IO OPC server for PROFINET IO communication; XML-DA |
| • PN CBA OPC server | PN CBA OPC server for access to CBA components; XML-DA |
| | Horizontal communication between OPC servers |
| PROFIBUS | |
| • DP-5613, SOFTNET-DP, SOFTNET-DP slave | DP-OPC server for PROFIBUS DP communication; XML-DA |
| • FMS-5613 | FMS-OPC server for PROFIBUS FMS communication; XML-DA |
| Others | |
| • DX OPC server | DX OPC server for simple data exchange even between different OPC servers from different companies |

## Ordering data

| | Order No. |
|---|---|
| **PN CBA OPC Server Edition 2006** | |
| PROFINET OPC server for CBA; runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 706-0HB64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 706-0HB00-3AL0** |
| • Upgrade to Version 2006, single license | **6GK1 706-0HB64-3AE0** |
| **DX OPC Server Edition 2006** | |
| Expansion of the OPC server with OPC DX function; runtime software, software and electronic manual on CD-ROM, license key on FD, Class A, for 32-bit Windows XP Professional, 2000 Professional/Server, 2003 Server; German/English | |
| • Single license for 1 installation | **6GK1 706-0XW64-3AA0** |
| • Upgrade to Version 2006, single license | **6GK1 706-0XW64-3AE0** |
| **SNMP OPC Server Edition 2006** | |
| Including MIB compiler; single license for 1 installation of the runtime software, software and electronic manual on CD-ROM; license key on diskette, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional WS/Server; for CP 1613 German/English | |
| • **Basic 2006**; administration of up to 20 IP addresses; single license for 1 installation | **6GK1 706-1NW64-3AA0** |
| - upgrade from V6.0 and higher to Edition 2006, single license | **6GK1 706-1NW64-3AE0** |
| • **Extended 2006**; administration of up to 200 IP addresses | **6GK1 706-1NX64-3AA0** |
| - upgrade from V6.0 and higher to Edition 2006, single license | **6GK1 706-1NX64-3AE0** |
| • **Power Pack 2006**; upgrade from SNM OPC Server Basic to SNM OPC Server Extended, single license | **6GK1 706-1NW64-3AC0** |

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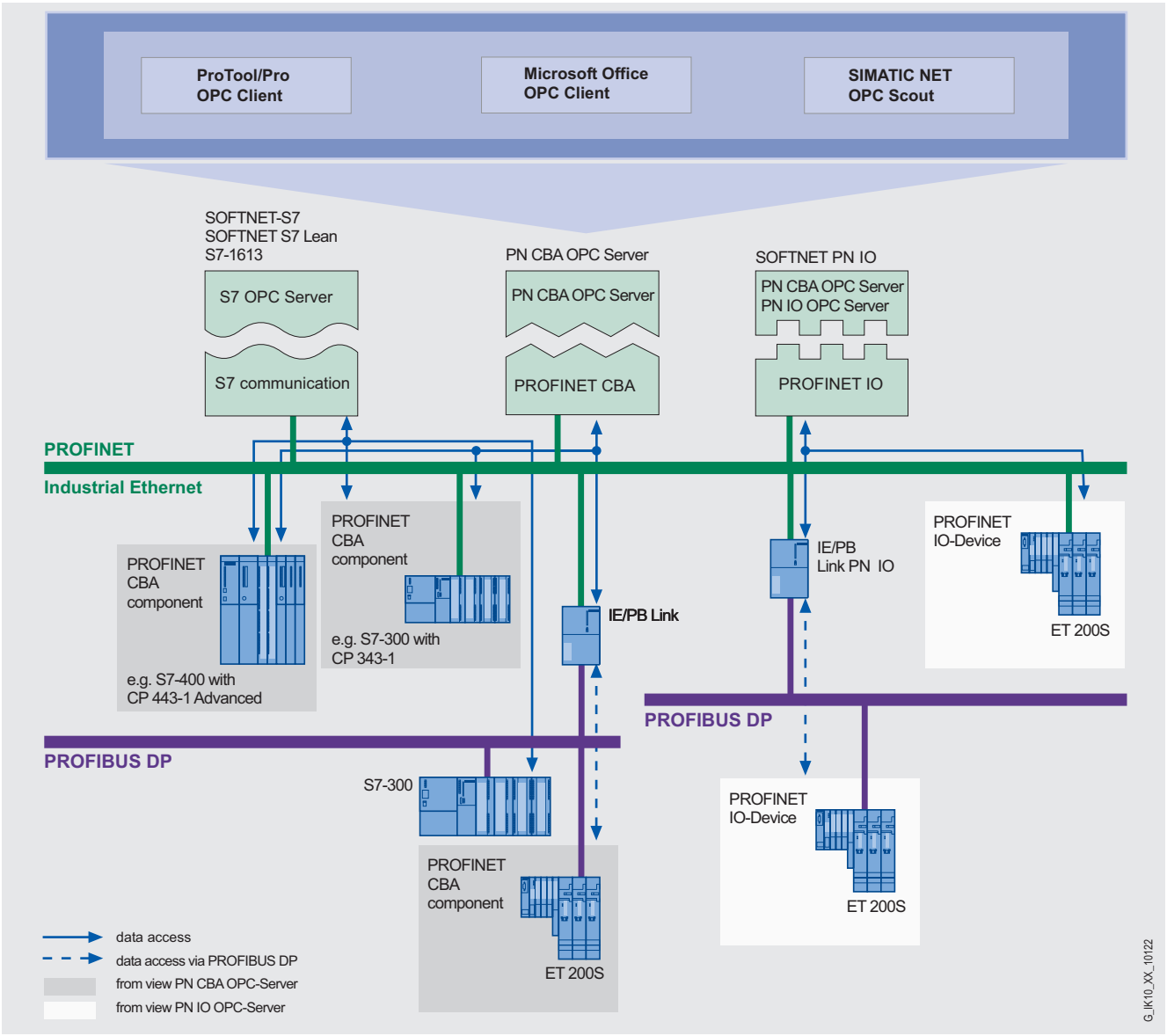
## PN CBA OPC Server

### Overview

- Access to variables in PROFINET CBA components over the OPC interface
- Use of the objects and symbols defined using the PROFINET engineering tool SIMATIC iMap and STEP 7
- Adding PROFINET functionality to existing installations. This enables it to be used in parallel with other communication protocols such as S7 communication with SOFTNET-S7 for Industrial Ethernet.
- OPC Scout as an OPC client with browser functions for the variables of the PROFINET CBA components




System integration with the PN CBA OPC server

## Technical specifications

| | PN CBA OPC server |
|---|---|
| Programming | • Open and standardized<br>• Synchronous and asynchronous reading and writing of variables<br>• Monitoring of variables by the OPC server with an alarm message to the client in the case of a change<br>• Use of batch operations, so a large volume of data can be processed in a short time |
| Interfaces | • Custom Interface (C++, .NET)<br>• Automation Interface (Visual Basic, Excel, Access,...)<br>• OPC Data Control<br>• OPC XML Interface for Data Access |
| Protocols | • DCOM protocol |
| Configuration | Configuring software for PROFINET SIMATIC iMap |
| **PROFINET communication (CBA)** | |
| • Number of communication partners | max. 228 |
| • Number of connections | max. 10,000 |

## Ordering data

| | Order No. |
|---|---|
| **PN CBA OPC server Edition 2006** | |
| PROFINET OPC server for CBA; runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2000 Professional/Server; German/English | |
| • Single license for 1 installation | **6GK1 706-0HB64-3AA0** |
| • Software Update Service for 1 year, with automatic extension; requirement: current software version | **6GK1 706-0HB00-3AL0** |
| • Upgrade to Version 2006, single license | **6GK1 706-0HB64-3AE0** |
| **DX OPC Server Edition 2006** | |
| Expansion of the OPC server with OPC DX function; runtime software, software and electronic manual on CD-ROM, license key on FD, Class A, for 32-bit Windows XP Professional, 2000 Professional/Server, 2003 Server; German/English | |
| • Single license for 1 installation | **6GK1 706-0XW64-3AA0** |
| • Upgrade to Version 2006, single license | **6GK1 706-0XW64-3AE0** |
| **Software iMap V3.0** | |
| for configuring PROFINET CBA<br>*Requirement:*<br>Windows 2000 Prof. with Service Pack 4 or later or Windows XP Prof. with Service Pack 1 or later or Windows 2003 Server with Service Pack 1 or later; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 or later with Service Pack 3, PN OPC Server V6.3 or later<br>*Type of supply:*<br>German, English with electronic documentation | |
| • Single license D) | **6ES7 820-0CC04-0YA5** |
| • Software Update Service D) | **6ES7 820-0CC01-0YX2** |
| • Upgrade to V3.0, single license D) | **6ES7 820-0CC04-0YE5** |

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

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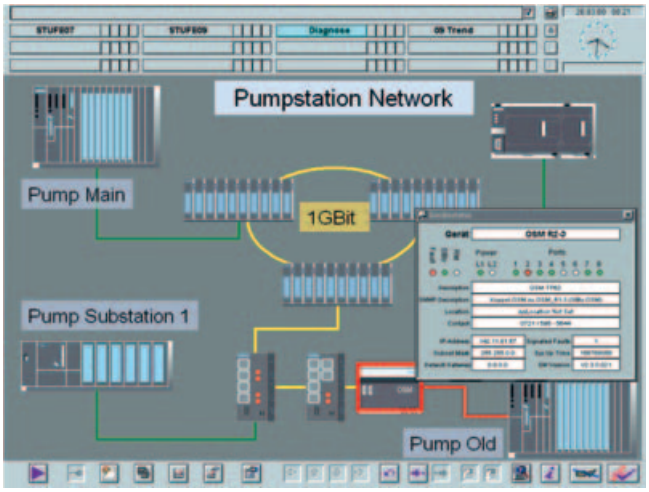
## SNMP OPC Server

### Overview




- Status monitoring and network management of SNMP-capable devices in any OPC client systems; e.g. SIMATIC HMI/SCADA, office application
- Easy access to SNMP-capable devices over the OPC interface
- Devices without SNMP agents can be monitored using the ping mechanism
- Complete integration in the SIMATIC NET OPC server environment
- SNMP can be implemented in parallel with other communications protocols such as PROFINET or S7 communication
- Configuring with STEP 7 or NCM PC
- Autodiscovery function for integrating accessible Ethernet devices (STEP 7 V5.3+SP3 or higher)

### Ordering data

| | Order No. |
|---|---|
| **SNMP OPC Server Edition 2006** | |
| Including MIB compiler; single license for 1 installation of the runtime software, software and electronic manual on CD-ROM; license key on diskette, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional WS/Server; for CP 1613 German/English | |
| • **Basic 2006** Administration of up to 20 IP addresses; Single license for 1 installation | **6GK1 706-1NW64-3AA0** |
| - Power Pack 2006; upgrade from SNM OPC Server Basic to SNM OPC Server Extended, single license | **6GK1 706-1NW64-3AC0** |
| - Upgrade from V6.0 and higher to Edition 2006, single license | **6GK1 706-1NW64-3AE0** |
| • **Extended 2006** Administration of up to 200 IP addresses | **6GK1 706-1NX64-3AA0** |
| - Upgrade from V6.0 and higher to Edition 2006, single license | **6GK1 706-1NX64-3AE0** |
| **DX OPC Server Edition 2006** | |
| Expansion of the OPC server with OPC DX function; runtime software, software and electronic manual on CD-ROM, license key on FD, Class A, for 32-bit Windows XP Professional, 2000 Professional/Server, 2003 Server; German/English | |
| • Single license for 1 installation | **6GK1 706-0XW64-3AA0** |
| • Upgrade to Version 2006, single license | **6GK1 706-0XW64-3AE0** |

# PC-based Automation

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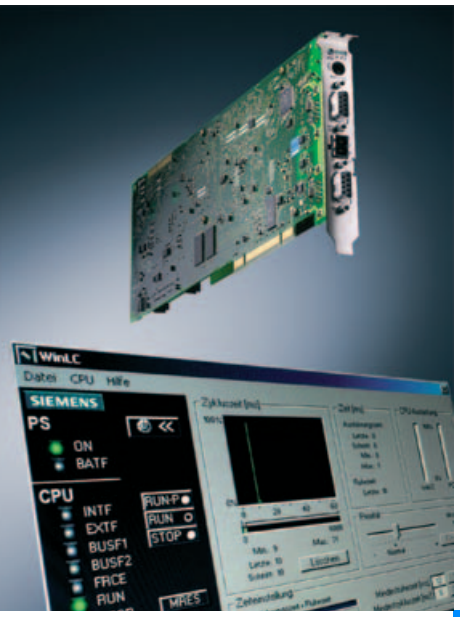




***Brochures***

For brochures serving as selection guides for SIMATIC products refer to:

http://www.siemens.com/simatic/printmaterial

# SIMATIC Microbox 420-RTX

## Overview


- Quick start in automation solutions with embedded PC platforms.
  - SIMATIC WinAC RTX pre-installed and ready to use on Microbox PC 420
  - PROFIBUS and Industrial Ethernet completely configured for use in a SIMATIC environment
  - Configuring and programming with SIMATIC STEP 7 via Industrial Ethernet or PROFIBUS
- Robust operation
  - Diskless operation based on Compact Flash card (CF card) and Windows XP embedded
  - Operation without fan
- Flexibility of a PC-based automation environment
  - Free memory space available on CF card for further PC applications
  - Use of WinAC ODK with SIMATIC WinAC RTX
  - Connectivity for USB devices, flat-panel monitor or screen
  - PC104+ cards pluggable
- Data retentivity for WinAC RTX even without uninterruptible power supply (UPS)

## Technical specifications

| | 6ES7 675-1BB30-0PA0 |
|---|---|
| **Power supply** | |
| Input voltage | |
| • Rated value, 24 V DC | Yes |
| • permissible range, lower limit (DC) | 20.4 V |
| • permissible range, upper limit (DC) | 28.8 V |
| Input current | |
| • Rated value at 24 V DC | 2,500 mA |
| **Supply voltages** | |
| Power supply and voltage jumpering | |
| • Mains/voltage failure jumpering | 5 ms |
| **interfaces** | |
| Graphics interface | combined VGA/ DVI port |
| Serial interface | COM1 (RS232) |
| PROFIBUS/MPI | Integr. CP 5611 inteface |
| USB | 2x USB 2.0 high speed/high current; 2x USB 2.0 high speed/low current |
| Ethernet | 2x VIA VT6105LOM, 10/100MBit/s with RJ45 |
| **Dimensions** | |
| Width | 262 mm |
| Height | 133 mm |
| Depth | 47 mm |
| **Weights** | |
| Weight | 2 kg |

## Ordering data

| | | Order No. |
|---|---|---|
| **SIMATIC Microbox 420-RTX** | D) | **6ES7 675-** ■ **B** ■ **30-0** ■ **A0** |
| Memory capacity<br>512 Mbyte SDRAM-133,<br>2 interfaces 10/100 Mbit/s Ethernet RJ45, 4 USB- and<br>1 serial interface (COM 1),<br>1 slot for Compact Flash Drive,<br>Watchdog, temperature monitoring | | |
| Software configuration: | | |
| WinAC RTX | | **1** |
| Processor: | | |
| Celeron 400 MHz, 100 MHz FSB, PROFIBUS DP12 | | **B** |
| Celeron 650 MHz, 100 MHz FSB, PROFIBUS DP12 | | **D** |
| Pentium III 933 MHz, 133 MHz FSB, PROFIBUS DP12 | | **F** |
| Mass storage: | | |
| 1 Gbyte CompactFlash, Windows XP embedded and Software preinstalled | | **P** |
| 2 Gbyte CompactFlash, Windows XP embedded and Software preinstalled | | **Q** |

| | | Order No. |
|---|---|---|
| **Delivery versions (ex-works)** | | |
| **SIMATIC Microbox 420-RTX**<br>Memory capacity<br>512 Mbyte SDRAM-133,<br>2 interfaces 10/100 Mbit/s Ethernet RJ45, 4 USB- and<br>1 serial interface (COM 1),<br>1 slot for Compact Flash Drive,<br>Watchdog, temperature monitoring; with WinAC RTX,<br>Celeron 400 MHz, 100 MHz FSB,<br>PROFIBUS DP12, 1 Gbyte CompactFlash, Windows XP embedded and software preinstalled | F) | **6ES7 675-1BB30-0PA0** |
| **SIMATIC Microbox 420-RTX**<br>Memory capacity<br>512 Mbyte SDRAM-133,<br>2 interfaces 10/100 Mbit/s Ethernet RJ45, 4 USB- and<br>1 serial interface (COM 1),<br>1 slot for Compact Flash Drive,<br>Watchdog, temperature monitoring; with WinAC RTX,<br>Pentium 933 MHz, 133 MHz FSB,<br>PROFIBUS DP12, 2 Gbyte CompactFlash, Windows XP embedded and software preinstalled | D) | **6ES7 675-1BF30-0QA0** |

D) Subject to export regulations: AL: N and ECCN: 5D992B1
F) Subject to export regulations: AL: N and ECCN: 5D002ENC3

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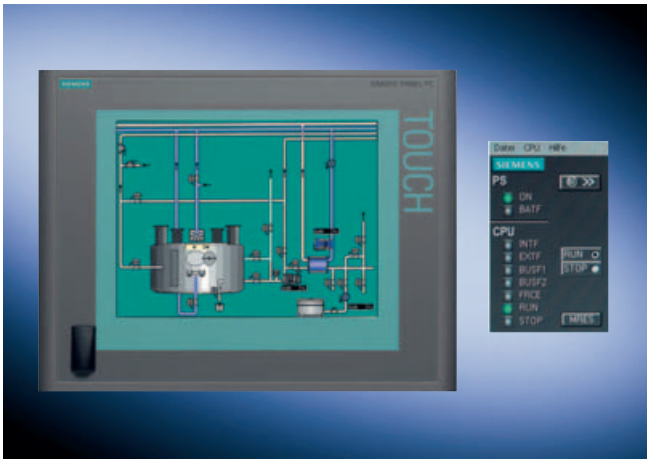
# SIMATIC Panel PC 477-HMI, -HMI/RTX

## Overview

***SIMATIC Panel PC 477 HMI and HMI/RTX***




- Quick start in automation solutions with embedded automation
  - SIMATIC WinCC flexible RT preinstalled and ready-to-run (Panel PC 477-HMI) or SIMATIC WinCC flexible and SIMATIC WinAC RTX preinstalled and ready-to-run (Panel PC 477-HMI/RTX)
  - PROFIBUS and Industrial Ethernet completely configured for use in a SIMATIC environment
  - configuration and programming with SIMATIC WinCC flexible ES and SIMATIC STEP 7 via Industrial Ethernet or PROFIBUS
- Robust operation
  - diskless operation based on Compact Flash card (1 GB CF card) and Windows XP embedded
  - fanless operation
- Flexibility of a PC-based automation environment
  - open for additional PC applications
  - expandable with PC/104+ cards
  - connectivity for USB devices, flat-panel monitor or screen
  - use of WinAC ODK with SIMATIC WinAC RTX
- Data retentivity for WinAC RTX even without uninterruptible power supply (UPS)

## Ordering data

| | | Order No. |
|---|---|---|
| **Panel PC configuration** | | |
| **SIMATIC Panel PC 477 embedded** | D) | **6AV7 84■-0■■10-0■B0** |
| Fronts with USB 2.0 interface; 512 MB SDRAM main memory; Windows XP embedded operating system | | |
| **Front panels** | | |
| • 12" TFT Touch | | **1** |
| • 12“ TFT Key | | **2** |
| • 15" TFT Touch | | **3** |
| • 15“ TFT Key | | **4** |
| **Power supply** | | |
| • 24 V DC | | **A** |
| • 110/230 V AC, power cable for Europe | | **B** |
| **Processor/PROFIBUS** | | |
| • Intel Celeron 650 MHz | | **C** |
| • Intel Celeron 650 MHz, PROFIBUS DP 12 (on-board) | | **D** |
| • Intel Pentium 3, 933 MHz | | **E** |
| • Intel Pentium 3, 933 MHz, PROFIBUS DP 12 (on-board) | | **F** |
| **Mass storage** | | |
| With operating system, Windows XP embedded preinstalled | | |
| • CompactFlash 512 MB | | **B** |
| • CompactFlash 1 GB | | **C** |
| • CompactFlash 2 GB | | **D** |

| | | Order No. |
|---|---|---|
| **Panel PC configuration** | | |
| **SIMATIC Panel PC 477 embedded** | D) | **6AV7 84■-0■■10-0■B0** |
| **Mass storage** (continued) | | |
| With operating system and HMI, WinCC flexible preinstalled, Windows XP embedded preinstalled | | |
| • CompactFlash 1 GB, RT 128 PT | | **F** |
| • CompactFlash 1 GB, RT 512 PT | | **G** |
| • CompactFlash 1 GB, RT 2048 PT | | **H** |
| • CompactFlash 2 GB, RT 128 PT | | **R** |
| • CompactFlash 2 GB, RT 512 PT | | **S** |
| • CompactFlash 2 GB, RT 2048 PT | | **T** |
| With operating system and HMI/RTX; Windows XP embedded preinstalled, Win AC RTX preinstalled and configured | | |
| • CompactFlash 1 GB, RT 128 PT | | **L** |
| • CompactFlash 1 GB, RT 512 PT | | **M** |
| • CompactFlash 1 GB, RT 2048 PT | | **N** |
| • CompactFlash 2 GB, RT 128 PT | | **U** |
| • CompactFlash 2 GB, RT 512 PT | | **V** |
| • CompactFlash 2 GB, RT 2048 PT | | **W** |

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

## Ordering data

| | | Order No. |
|---|---|---|
| **Storage versions** | | |
| **12" TFT Touch**<br>24 V DC power supply, Celeron 650 MHz, with PROFIBUS DP 12, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 841-0AD10-0CB0** |
| **12" TFT Touch**<br>24 V DC power supply, Pentium P3 933 MHz, with PROFIBUS DP 12, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 841-0AF10-0CB0** |
| **12" TFT Keys**<br>24 V DC power supply, Pentium P3 933 MHz, with PROFIBUS DP 12, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 842-0AF10-0CB0** |
| **15" TFT Touch**<br>24 V DC power supply, Celeron 650 MHz, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 843-0AC10-0CB0** |
| **15" TFT Touch**<br>24 V DC power supply, Pentium P3 933 MHz, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 843-0AE10-0CB0** |
| **15" TFT Touch**<br>24 V DC power supply, Pentium P3 933 MHz, with PROFIBUS DP 12, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 843-0AF10-0CB0** |
| **15" TFT Touch**<br>110/230 V AC power supply, Pentium P3 933 MHz, with PROFIBUS DP 12, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 843-0BF10-0CB0** |
| **15" TFT Keys**<br>24 V DC power supply, Pentium P3 933 MHz, with PROFIBUS DP 12, 512 MB RAM, 1 GB CompactFlash with Windows XP embedded | D) | **6AV7 844-0AF10-0CB0** |

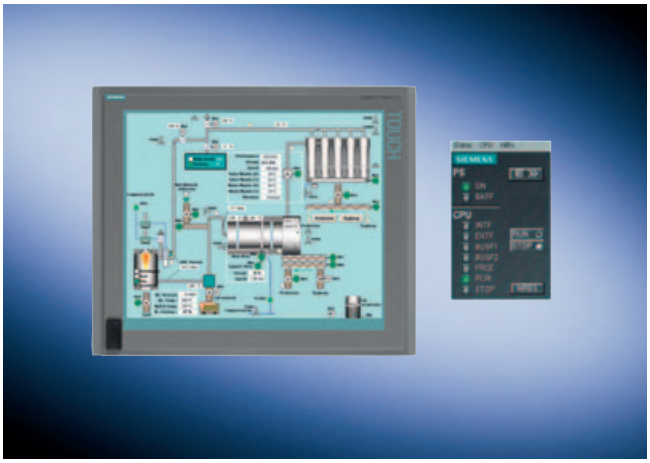
| | | Order No. |
|---|---|---|
| **Accessories** | | |
| **Cover foil for Panel PCs 477/577/677/877**<br>For protecting the touch screen against dirt/scratches | | |
| • for 12" Touch | | **6AV7 671-2BA00-0AA0** |
| • for 15" Touch | | **6AV7 671-4BA00-0AA0** |
| • for 19“ Touch | | **6AV7 672-1CE00-0AA0** |
| **Labeling foil for Panel PCs 477/577/677/877**<br>For labeling softkeys and function keys, blank, supplied in sets of 10 | | **6AV7 672-0DA00-0AA0** |
| **Non-heating apparatus cable for SIMATIC Box and Panel PC**<br>SIMATIC PC power cable, 230 V AC, angled, 3 m, for: | | |
| • Germany | | **6ES7 900-1AA00-0XA0** |
| • United Kingdom | | **6ES7 900-1BA00-0XA0** |
| • Switzerland | | **6ES7 900-1CA00-0XA0** |
| • USA | | **6ES7 900-1DA00-0XA0** |
| • Italy | | **6ES7 900-1EA00-0XA0** |
| • China | | **6ES7 900-1FA00-0XA0** |
| **Expansion components** | | |
| **SIMATIC PC/PG DiagMonitor V3.1**<br>Software tool for monitoring SIMATIC PCs, incl. manual, on CD-ROM (German/English) | E) | **6ES7 648-6CA03-1YX0** |
| **SIMATIC PC/PG Image & Partition Creator**<br>Software tool for data backup and hard-disk partitioning for SIMATIC PCs, incl. manual, on CD-ROM (Ger/En/Fr/Sp/It) | E) | **6ES7 648-6AA04-0YX0** |
| **3.5" disk drive, USB**<br>With 1 m connecting cable | A) | **6FC5 235-0AA05-1AA2** |
| **Compact Flash Card** | | |
| • 256 MB | A) | **6ES7 648-2BF01-0XC0** |
| • 512 MB | A) | **6ES7 648-2BF01-0XD0** |
| • 1 GB | A) | **6ES7 648-2BF01-0XE0** |
| • 2 GB | A) | **6ES7 648-2BF01-0XF0** |
| **SIMATIC PC USB FlashDrive**<br>1 GB, USB 2.0, metal enclosure, boot capability | A) | **6ES7 648-0DC30-0AA0** |
| **Expansion kit PC/104**<br>For integration of PC/104 modules (packing unit contains 6 expansion frames) | A) | **6AG4 070-0BA00-0XA0** |
| **Industrial HUB 4**<br>4 x USB 2.0, IP65 for control cabinet door or DIN rail | A) | **6AV6 671-3AH00-0AX0** |

A) Subject to export regulations: AL: N and ECCN: EAR99H
D) Subject to export regulations: AL: N and ECCN: 5D992B1
E) Subject to export regulations: AL: N and ECCN: EAR99S

# SIMATIC Panel PC 477B-HMI, -HMI/RTX

## Overview

***SIMATIC Panel PC 477B HMI and HMI/RTX*** [1)]



- Quick start in automation solutions with Embedded Automation
  - SIMATIC WinCC flexible RT pre-installed ready for operation (Panel PC 477-HMI) or SIMATIC WinCC flexible and SIMATIC WinAC RTX pre-installed ready for operation (Panel PC 477-HMI/RTX)
  - PROFIBUS and Industrial Ethernet configured for application in a SIMATIC environment
  - Configuration and programming with SIMATIC WinCC flexible ES and SIMATIC STEP 7 via Industrial Ethernet or PROFIBUS
- Rugged operation
  - No hard-drive operation based on Compact-Flash-Card (1 GByte CF-Card) and Windows XP embedded
  - Operation without fan
- Flexibility of a PC-based automation environment
  - Open for other PC applications
  - Can be expanded with PC/104+ cards
  - Capability of connection for USB devices, Flat Panel monitor or screen
  - Application of WinAC ODK with SIMATIC WinAC RTX
- Data retention for WinAC RTX without uninterruptible power supply (UPS)

1) Available soon

## Ordering data

| | | Order No. |
|---|---|---|
| **Panel PC Configurator (all variants ex stock)** | | |
| **SIMATIC Panel PC 477B embedded** | D) | **6ES7 676-■BA00-0■■0** |
| Celeron M 1.0 GHz processor, main memory 1 GB DDR2 SDRAM, power supply 24 V DC, PROFIBUS DP interface | | |
| **Front panels** | | |
| • 12" TFT Touch | | **1** |
| • 12" TFT Key | | **2** |
| • 15" TFT Touch | | **3** |
| • 15" TFT Key | | **4** |
| • 19" TFT Touch | | **6** |
| **Mass storage** | | |
| • CompactFlash 1 GB | | **B** |
| • CompactFlash 2 GB | | **C** |
| • CompactFlash 4 GB [1)] | | **D** |
| **Mass storage** (continued) | | |
| • With operating system, Windows XP embedded preinstalled | | **A** |
| With operating system and HMI, Windows XP embedded preinstalled, WinCC flexible RT (incl. archives / recipes) preinstalled | | |
| • Number of tags 128 PT | | **C** |
| • Number of tags 512 PT | | **D** |
| • Number of tags 2048 PT | | **E** |
| With operating system and HMI/RTX Windows XP embedded preinstalled, WinCC flexible RT (incl. archives / recipes) preinstalled, Win AC RTX preinstalled and configured | | |
| • Number of tags 128 PT [1)] | | **F** |
| • Number of tags 512 PT [1)] | | **G** |
| • Number of tags 2048 PT [1)] | | **H** |

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

1) Available soon;
Estimated start of delivery is October 2007.

| Ordering data | | Order No. |
|---|---|---|
| **Accessories** | | |
| **Cover foil for Panel PCs 477/577/677/877** | | |
| For protecting the touch screen against dirt/scratches | | |
| • for 12" Touch | | **6AV7 671-2BA00-0AA0** |
| • for 15" Touch | | **6AV7 671-4BA00-0AA0** |
| • for 19" Touch | | **6AV7 672-1CE00-0AA0** |
| **Labeling foil for Panel PCs 477/577/677/877** | | **6AV7 672-0DA00-0AA0** |
| For labeling softkeys and function keys, blank, supplied in sets of 10 | | |
| **Expansion components** | | |
| **SIMATIC PC/PG DiagMonitor V3.1** | E) | **6ES7 648-6CA03-1YX0** |
| Software tool for monitoring SIMATIC PCs, incl. manual, on CD-ROM (German/English) | | |
| **SIMATIC PC/PG Image & Partition Creator** | E) | **6ES7 648-6AA04-0YX0** |
| Software tool for data backup and hard-disk partitioning for SIMATIC PCs, incl. manual, on CD-ROM (Ger/En/Fr/Sp/It) | | |
| **3.5" disk drive, USB** | A) | **6FC5 235-0AA05-1AA2** |
| With 1 m connecting cable | | |
| **Compact Flash Card** | | |
| • 256 Mbyte | A) | **6ES7 648-2BF01-0XC0** |
| • 512 MB | A) | **6ES7 648-2BF01-0XD0** |
| • 1 Gbyte | A) | **6ES7 648-2BF01-0XE0** |
| • 2 Gbyte | A) | **6ES7 648-2BF01-0XF0** |
| • 4 GB 1) | A) | **6ES7 648-2BF01-0XG0** |
| **SIMATIC PC USB FlashDrive** | A) | **6ES7 648-0DC30-0AA0** |
| 1 GB, USB 2.0, metal enclosure, bootable | | |
| **Expansion kit PC/104** | A) | **6AG4 070-0BA00-0XA0** |
| For integration of PC/104 modules (packing unit contains 6 expansion frames) | | |
| **Industrial USB Hub 4** | A) | **6AV6 671-3AH00-0AX0** |
| 4 x USB 2.0, IP65 for control cabinet door or DIN rail | | |

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

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

1) Estimated start of delivery is October 2007.

Please note:

The scope of supply of the Panel PC 477B mainly comprises the Panel PC and a software pack, i.e. CompactFlash card with preinstalled and configured software as well as all the necessary license keys. After the CompactFlash card has been inserted in the (internal) slot provided, the unit is ready for switching on.

# SIMATIC WinAC MP 2007

## Overview

- WinAC MP 2007 software PLC based on Windows CE
- For both MP platforms 277 and 377, an optimized version is available
- The economical solution for all applications in combination with a rugged hardware platform
- Ideal for tasks on the machine level, saves space and costs
- Best service concept, backup/restore all data on a standard MultiMediaCard or standard USB stick

## Technical specifications

| | 6ES7 671-5EF00-0YA0 | 6ES7 671-7EG00-0YA0 |
|---|---|---|
| **Memory** | | |
| Type of storage | | |
| • RAM | | |
| - integrated | 256 KByte | 512 KByte |
| - expandable | No | No |
| **CPU/blocks** | | |
| DB | | |
| • Number, max. | 1,024 | 2,048 |
| • Size, max. | 64 KByte | 64 KByte |
| FB | | |
| • Number, max. | 1,024 | 2,048 |
| • Size, max. | 64 KByte | 64 KByte |
| FC | | |
| • Number, max. | 1,024 | 2,048 |
| • Size, max. | 64 KByte | 64 KByte |
| OB | | |
| • Number, max. | 18 | 18 |
| • Size, max. | 64 KByte | 64 KByte |
| Nesting depth | | |
| • per priority class | 8 | 16 |
| • additional within an error OB | 2 | 2 |
| **Times/counters and their remanence** | | |
| S7 counter | | |
| • Number | 256 | 512 |
| • Remanence | | |
| - adjustable | Yes | Yes |
| - preset | 8 | 8 |
| • Counting range | | |
| - lower limit | 0 | 0 |
| - upper limit | 999 | 999 |

| | 6ES7 671-5EF00-0YA0 | 6ES7 671-7EG00-0YA0 |
|---|---|---|
| IEC counter | | |
| • present | Yes | Yes |
| S7 times | | |
| • Number | 256 | 512 |
| • Remanence | | |
| - adjustable | Yes | Yes |
| - preset | 0 | 0 |
| • Time range | | |
| - lower limit | 10 ms | 10 ms |
| - upper limit | 9,990 s | 9,990 s |
| IEC timer | | |
| • present | Yes | Yes |
| **Data areas and their remanence** | | |
| Retentive data area in total (incl. times, counters, flags), max. | 128 KByte | 256 KByte |
| Flag | | |
| • Number, max. | 2 KByte | 4 KByte |
| • Remanence available | Yes | Yes |
| Data blocks | | |
| • Number, max. | 1,024 | 2,048 |
| • Size, max. | 64 KByte | 64 KByte |
| Local data | | |
| • per priority class, max. | Adjustable, 16,384 bytes maximum for all priority classes | Adjustable, 16,384 bytes maximum for all priority classes |
| **Address area** | | |
| I/O address area | | |
| • Inputs | 2 KByte | 8 KByte |
| • Outputs | 2 KByte | 8 KByte |

## Technical specifications (continued)

| | 6ES7 671-5EF00-0YA0 | 6ES7 671-7EG00-0YA0 |
|---|---|---|
| Process image | | |
| • Inputs | 2 KByte | 2 KByte |
| • Outputs | 2 KByte | 2 KByte |
| • Inputs, adjustable | 2 KByte | 2 KByte |
| • Outputs, adjustable | 2 KByte | 2 KByte |
| • Inputs, preset | 512 Byte | 512 Byte |
| • Outputs, preset | 512 Byte | 512 Byte |
| • consistent data, max. | 32 Byte | 32 Byte |
| **Hardware config.** | | |
| Number of DP masters | | |
| • integrated | 1 | 1 |
| **Time** | | |
| Operating hours counter | | |
| • Number | 8 | 8 |
| • Number/Number range | 0 to 7 | 0 to 7 |
| **S7 message functions** | | |
| Process diagnostic messages | Yes | Yes |
| **Test commissioning functions** | | |
| Status/control | | |
| • Status/control variable | Yes | Yes |
| Forcing | | |
| • Forcing | No | No |
| Diagnostic buffer | | |
| • present | Yes | Yes |
| • Number of entries, max. | 1,000; 120 preset | 1,000; 120 preset |
| • adjustable | Yes | Yes |
| **Communication functions** | | |
| Number of logical connections (also in network), max. | 16 | 32 |
| PG/OP communication | Yes | Yes |
| Routing | Yes | Yes |
| Global data communication | | |
| • supported | No | No |
| S7 basic communication | | |
| • supported | No | No |
| S7 communication | | |
| • supported | Yes | Yes |
| • as server | Yes | Yes |
| • as client | Yes | Yes |
| • Useful data per job, max. | 480 Byte | 480 Byte |

| | 6ES7 671-5EF00-0YA0 | 6ES7 671-7EG00-0YA0 |
|---|---|---|
| Number of connections | | |
| • overall | 16; DP max.8, rest PN | 32; DP max.8, rest PN |
| • reserved for PG communication | 1 | 1 |
| • reserved for OP communication | 1 | 1 |
| • usable for routing | 8 | 16 |
| **1st interface** | | |
| DP master | | |
| • Number of connections, max. | 8 | 8 |
| • Services | | |
| - PG/OP communication | Yes | Yes |
| - Routing | Yes | Yes |
| - Global data communication | No | No |
| - S7 basic communication | No | No |
| - S7 communication | Yes | Yes |
| - Equidistance support | No | No |
| - SYNC/FREEZE | Yes | Yes |
| - Activation/deactivation of DP slaves | Yes | Yes |
| - DPV1 | Yes | Yes |
| • Transmission speeds, max. | 12,000 kBit/s | 12,000 kBit/s |
| • Number of DP slaves, max. | 32 | 32 |
| • Address area | | |
| - Inputs, max. | 2,048 KByte | 8,192 KByte |
| - Outputs, max. | 2,048 KByte | 8,192 KByte |
| **CPU/programming** | | |
| Configuration software | | |
| • STEP 7 | Yes | Yes |
| • WinCC flexible Compact | No | No |
| • WinCC flexible Standard | Yes | Yes |
| • WinCC flexible Advanced | Yes | Yes |
| Programming language | | |
| • LAD | Yes | Yes |
| • FUP | Yes | Yes |
| • AWL | Yes | Yes |
| Cycle time monitoring | | |
| • adjustable | Yes | Yes |
| • preset | 6,000 ms | 6,000 ms |
| **Operating systems** | | |
| Operating system | | |
| • Windows CE | Yes | Yes |
| **Online languages** | | |
| Number | 1; English | 1; English |

## SIMATIC WinAC MP 2007

### Ordering data

| | | Order No. |
|---|---|---|
| **WinAC MP 2007, version WinAC MP 277** [2] | E) | **6ES7 671-5EF00-0YA0** |
| incl. a single license for MP 277 on USB stick[1] and electronic documentation | | |
| **WinAC MP 2007, version WinAC MP 377** [2] | E) | **6ES7 671-7EG00-0YA0** |
| incl. a single license for MP 377 on USB stick[1] and electronic documentation | | |
| ***Complete pre-assembled packages*** | | |
| **Package MP 277 8" Touch** | F) | **6AV6 652-3MC01-1AA0** |
| • MP 277<br>• Single license for MP 277 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 277 8" Key** | F) | **6AV6 652-3LC01-1AA0** |
| • MP 277<br>• Single license for MP 277 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 277 10" Touch** | F) | **6AV6 652-3PC01-1AA0** |
| • MP 277<br>• Single license for MP 277 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 277 10" Key** | F) | **6AV6 652-3NC01-1AA0** |
| • MP 277<br>• Single license for MP 277 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 377 12" Touch** | F) | **6AV6 652-4FC01-2AA0** |
| • MP 377<br>• Single license for MP 377 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 377 12" Key** | F) | **6AV6 652-4EC01-2AA0** |
| • MP 377<br>• Single license for MP 377 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 377 15" Touch** | F) | **6AV6 652-4GC01-2AA0** |
| • MP 377<br>• Single license for MP 377 on USB stick[1]<br>• Standard SD Card (empty) | | |
| **Package MP 377 19" Touch** | F) | **6AV6 652-4HC01-2AA0** |
| • MP 377<br>• Single license for MP 377 on USB stick[1]<br>• Standard SD Card (empty) | | |

E) Subject to export regulations: AL: N and ECCN: EAR99S
F) Subject to export regulations: AL: N and ECCN: 5D002ENC3

1) Can only be used for license handling
2) VCL version upon request

# 14 Appendix



## Faster and more applicable know-how: Hands-on training from the manufacturer

**SITRAIN®** – the Siemens Training for Automation and Industrial Solutions – provides you with comprehensive support in solving your tasks.

Training by the market leader in automation and plant engineering enables you to make independent decisions with confidence. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.


**First-class know-how directly pays for itself: In shorter startup times, high-quality end products, faster trouble-shooting and reduced downtimes. In other words, increased profits and lower costs.**

### *Achieve more with SITRAIN*

- Shorter times for startup, maintenance and servicing
- Optimized production operations
- Reliable configuration and startup
- Minimization of plant downtimes
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff

## Contact

Visit our site on the Internet at:

*www.siemens.com/sitrain*

or let us advise you personally. You can request our latest training catalog from:

### *SITRAIN Customer Support Germany:*

Phone: +49 (0)1805 / 23 56 11
Fax: +49 (0)1805 / 23 56 12

(0.14 €/min from the German landline network)

## SITRAIN highlights

### *Top trainers*

Our trainers are skilled teachers with direct practical experience. Course developers have close contact with product development, and directly pass on their knowledge to the trainers.

### *Practical experience*

The practical experience of our trainers enables them to teach theory effectively. But since theory can be pretty drab, we attach great importance to practical exercises which can comprise up to half of of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. This training approach will give you all the confidence you need.

### *Wide variety*

With a total of about 300 local attendance courses, we train the complete range of A&D products as well as interaction of the products in systems. Telecourses, teach-yourself software and seminars with a presenter on the Web supplement our classic range of courses.

### *Tailor-made training*

We are only a short distance away. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. You wish to have individual training instead of one of our 300 courses? Our solution: We will provide a program tailored exactly to your personal requirements. Training can be carried out in our Training Centers or at your company.

### *The right mixture: Blended learning*

"Blended learning" means a combination of various training media and sequences. For example, a local attendance course in a Training Center can be optimally supplemented by a teach-yourself program as preparation or follow-up. Additional effect: Reduced traveling costs and periods of absence.

## Technical books for automation engineering

### Overview

Technical books provide sound knowledge in the various sectors of automation engineering. Textbooks, reference books and dictionaries are available, for example.

You can use them to specifically increase your knowledge or to become acquainted with special areas.

### Ordering data

| | Order No. |
|---|---|
| **Milestones in Automation** | |
| Easy to read and creatively designed, the book offers technicians, engineers and managers a profound look into the development history and possibilities for use of a technology which left its mark like no other on industrial processes and a huge range of technical systems. | |
| German | **6ZB3 500-0AQ01-0AA0** |
| English | **6ZB3 500-0AQ02-0AA0** |
| **Automating with SIMATIC** | |
| The book is highly suitable for all those who have no extensive previous experience and who wish to become rapidly acquainted with the field of programmable controllers. | |
| German | **6ZB3 500-0AE01-0AA0** |
| English | **6ZB3 500-0AE02-0AA0** |
| **Automating with STEP 7 in STL and SCL** | |
| Now in its third edition, this book introduces Version 5.3 of the programming software STEP 7. It is aimed at all users of SIMATIC S7 controllers. | |
| German | **6ZB3 500-0AA01-0AA0** |
| English | **6ZB3 500-0AA02-0AA0** |
| **Automating with STEP 7 in LAD and FBD** | |
| The book describes elements and applications of the graphic-oriented programming languages LAD (ladder diagram) and FBD (function block diagram) for SIMATIC S7-300/400. It is aimed at all users of SIMATIC S7 controllers. | |
| German | **6ZB3 500-0AB01-0AA0** |
| English | **6ZB3 500-0AB02-0AA0** |
| **Controlling with SIMATIC** | |
| This book discusses the practical aspects of control engineering as a subdomain of automation and control using as example the SIMATIC S7 control system. | |
| German | **6ZB3 500-0AD01-0AA0** |
| English | **6ZB3 500-0AD02-0AA0** |

| | Order No. |
|---|---|
| **Decentralization with PROFIBUS-DP/DPV1** | |
| With its practical orientation the book is ideal for PROFIBUS planners, configuration experts and programmers. Its comprehensive description of the fundamentals involved also makes it interesting for students and docents alike. | |
| German | **6ZB3 500-0AC01-0AA0** |
| English | **6ZB3 500-0AC02-0AA0** |
| **Automating with PROFINET** | |
| This book serves as an introduction to PROFINET technology. Decision-makers and plant planners, pupils and students are given a compact overview of the concept and the fundamentals. Configuring engineers, commissioning engineers and technicians are provided with the comprehensive knowledge they need to solve their own PROFINET-based automation tasks. | |
| German | **6ZB3 500-0AP01-0AA0** |
| English | **6ZB3 500-0AP02-0AA0** |
| **Electrical Feed Drives in Automation** | |
| This book is a comprehensive introduction to the physical and technological fundamentals of automatic control and drive technology with special emphasis on the computation and dimensioning of electrical feed drives for automation. | |
| German | **6ZB3 500-0AF01-0AA0** |
| English | **6ZB3 500-0AF02-0AA0** |
| **Industrial Ethernet in der Industrieautomatisierung** | |
| This book passes on to plant planners, programmers and commissioning engineers the required basics and terms for use of Ethernet LAN technologies in industrial automation with SIMATIC. | |
| German | **6ZB3 500-0AM01-0AA0** |
| **Electrical feed drives in production/automation engineering** | |
| This book describes individual and up-to-date components for feed drives such as motors and mechanical transfer elements in a practical context. | |
| German | **6ZB3 500-0BC01-0AA0** |

## Technical books for automation engineering

### Ordering data (continued)

| | Order No. |
|---|---|
| **Dictionary of Drive Technology and Mechatronics** | |
| The dictionary offers a comprehensive collection of terms from the fields of drives and automation and related fields, completed by entries from business administration, marketing, advertising and technical training. | |
| German/English | **6ZB3 500-0AG01-0AA0** |
| German/English, on CD-ROM | **6ZB3 500-0AH01-0AA0** |

| | Order No. |
|---|---|
| **Dictionary of Electrical Engineering, Power Engineering and Automation** | |
| This dictionary is the standard work for all those requiring a comprehensive and reliable compilation of terms from the fields of power generation, transmission and distribution, drive engineering, automation, switchgear and installation engineering, power electronics as well as measurement, analysis and test engineering. | |
| German-English | **6ZB3 500-0AJ01-0AA0** |
| English-German | **6ZB3 500-0AJ02-0AA0** |
| German-English/ English-German; on CD-ROM | **6ZB3 500-0AJ03-0AA0** |

## SIMATIC Manual Collection

### Overview

The SIMATIC manual collection brings together the manuals of Totally Integrated Automation in the smallest possible package. It is eminently suitable for startup and service, replaces the space-consuming paper version in the office and provides fast access to the information.

The manual collection contains manuals in 5 languages for

- LOGO!
- SIMATIC S7-200, TD 200
- SIMATIC S7-300, C7
- SIMATIC S7-400
- STEP 7, Engineering Tools, Runtime Software
- SIMATIC DP (Distributed I/O)
- SIMATIC HMI (Human Machine Interface)
- SIMATIC NET (Industrial Communication)
- Machine Vision
- PCS 7 Process Control System

Manuals that are not yet available in all 5 languages will at least be included in English and German.

There is an update contract for the SIMATIC Manual Collection that encompasses supply of the up-to-date collection and three subsequent updates which is valid for one year. If the update contract is not cancelled, it is automatically extended and the list price will be charged to the customer.

### Ordering data

| | | Order No. |
|---|---|---|
| **SIMATIC Manual Collection** | D) | **6ES7 998-8XC01-8YE0** |
| Electronic manuals on DVD, in 5 languages: S7-200/300/400, C7, LOGO!, SIMATIC DP, PC, PG, STEP 7, engineering software, runtime software, PCS 7, SIMATIC HMI, SIMATIC NET | | |
| **SIMATIC Manual Collection update service for 1 year** | D) | **6ES7 998-8XC01-8YE2** |
| Current Manual Collection DVD as well as the three following updates | | |

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

## CE marking

The electronic products described in this catalog comply with the requirements and protection objectives of the following EU guidelines and with the harmonized European standards (EN) which have been published for programmable controllers in the official Journal of the European Union:

- 89/336/EWG “Electromagnetic Compatibility” (EMC guideline).
- 73/23/EWG “Electrical Equipment for Use Within Specific Voltage Limits” (low voltage guideline).

We have declarations of conformity available for the responsible authorities.

The SIMATIC products are designed for operation in industrial environments and comply with the following requirements:

Noise emissions: EN 50081-2: 1993
Noise immunity: EN 50082-2: 1995

The products can also be used in the domestic environment (household, business and trade area, small plants) with individual approval:

Emitted interference: Individual approval
Immunity: EN 50082-1: 1992

For household use an individual approval from the respective national authority or testing body is required as far as emitted-interference is concerned. In Germany this approval is issued by the Federal Post and Telecommunications Office and its subsidaries.

For the installation and operation of the products described in this catalog, the installation guidelines described in the manuals and the important notes concerning installation in cabinets and concerning the use of shielded cable must be complied with.

## Notes for machine manufacturers

The SIMATIC automation system is not a machine within the context of the EU machine guidelines. For SIMATIC, a conformity declaration with respect to the EU machine guidelines 89/392/EMC is not available.

The EU guideline for machines 89/392/EMC specifies the requirements for a machine. A machine is understood for the purposes of this guideline to be a combination of interconnected parts or mechanisms (see also EN 292-1, Paragraph 3.1).

SIMATIC is part of the electrical equipment of a machine and must therefore be included in the conformity declaration procedure by the machine manufacturer.

The EN 60204-1 standard (safety of machines, general requirements for the electrical equipment of machines) is applicable to the electrical equipment of machines.

The following table should be of assistance with the conformiy declaraton and shows which criteria of EN 60204-1 (as of June 1993) apply for SIMATIC:

| EN 60204-1 | Topic/criterion | Notes |
|---|---|---|
| Paragraph 4 | General requirements | The requirements are met when the equipment is assembled/installed in accordance with the installation guidelines.<br>Please note the relevant information in the manuals. |
| Paragraph 11.2 | Digital input/output interfaces | The requirements are met |
| Paragraph 12.3 | Programmable equipment | The requirements are met when the equipment is installed in lockable cabinets to protect against alteration of the memory contents by unauthorized persons |
| Paragraph 20.4 | Voltage tests | The requirements are met |

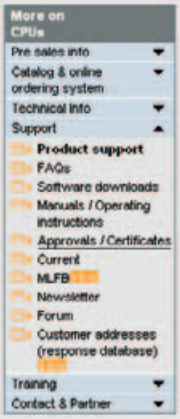
## Certificates, authorizations, approbations, declarations of conformity

An overview of the certificates available for SIMATIC products (CE, UL, CSA, FM, shipping authorizations) can be found in the internet at

http://www.siemens.com/simatic/certificates

The lists are continously updated. The data for products which have not yet been included in the overview is continously collected and prepared for the subsequent edition.

You can also find certificates, approbations, verification certificates or characteristic curves by going directly to the Link Box:




## Quality management

The quality management system of our A&D division complies with the international standard ISO 9001.

The products and systems described in this catalog are manufactured under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001.

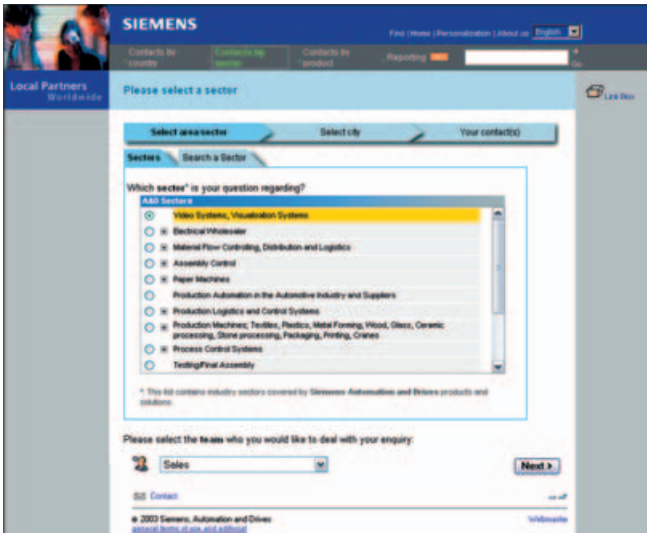
The DQS certificate is recognized in all EQ Net countries.

***DQS certificate nos.:***

Siemens AG
Automation and Drives

- Industrial Automation Systems
  Reg. No: 001323 QM

## Overview



At

http://www.siemens.com/automation/partners

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- Technical Support,
- Spare parts/repairs,
- Service,
- Training,
- Sales or
- Consultation/engineering.

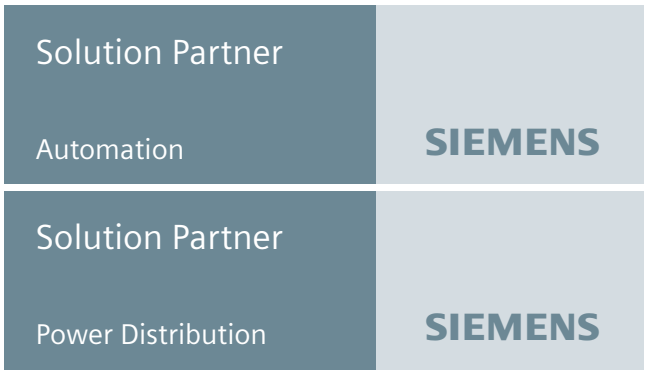
You start by selecting a

- Country,
- Product or
- Sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

# Siemens Solution Partner Automation and Power Distribution

## Overview




Products and systems from Siemens Automation and Drives provide the ideal platform for all automation tasks.

Siemens Solution Partners offer customized future-proof solutions with products and systems from Siemens Automation and Drives. The basis: qualified product and system knowledge coupled with a high degree of solutions and industry-related expertise.

In the Siemens Solution Partner Program you are certain to find the optimum partner for your specific requirements. Since more than 570 companies worldwide belong to the program, you can be sure to get expert support at your location.

The Solution Partner Finder, available to you on the Internet, is a comprehensive database in which all Solution Partners, together with their performance profiles, present themselves.

In addition to the search criteria Technology, Sector and Country, you can also search by Company and ZIP Code. From there it is only a small step to making the first contact.

Call up the Solution Partner Finder as follows:

- CA 01 on CD-ROM:
  On the start page via "Contacts & Partners; Siemens Solution Partner Automation and Power Distribution"
- CA 01 online:
  Go directly to the Solution Partner Finder:
  www.siemens.com/automation/partnerfinder

Additional information about the Siemens Solution Partner Program is available in the Internet at:
www.siemens.com/automation/solutionpartner

## A&D in the WWW


A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

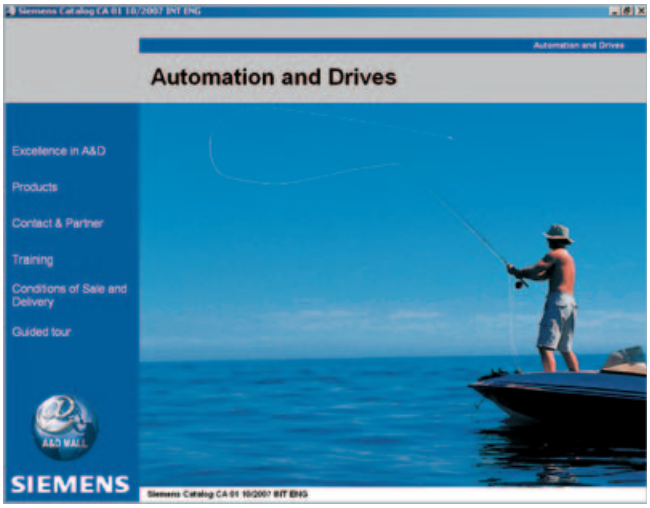
The Siemens Automation and Drives Group (A&D) has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

http://www.siemens.com/automation

you will find everything you need to know about products, systems and services.

## Product Selection Using the Offline Mall of Automation and Drives




Detailed information together with convenient interactive functions:
The Offline Mall CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.
All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the Offline Mall CA 01 can be found in the Internet under

http://www.siemens.com/automation/ca01

or on CD-ROM or DVD.

## Easy Shopping with the A&D Mall


The A&D Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

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http://www.siemens.com/automation/mall

## Our services for every phase of your project


In the face of harsh competition you need optimum conditions to keep ahead all the time:
A strong starting position. A sophisticated strategy and team for the necessary support - in every phase.
Service & Support from Siemens provides this support with a complete range of different services for automation and drives.

In every phase: from planning and startup to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

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http://www.siemens.com/automation/service&support

### Technical Support

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**Fax: +49 (0)180 50 50 223**
(0.14 €/min from the German fixed network)

http://www.siemens.com/automation/support-request

### Technical Consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consulting on product and system questions right to the creation of the automation solution.[1)]

### Configuration and Software Engineering

Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project.[1)]

### Service On Site

With Service On Site we offer services for startup and maintenance, essential for ensuring system availability.

In Germany
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(0.14 €/min from the German fixed network)

### Repairs and Spare Parts

In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliability.

In Germany
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(0.14 €/min from the German fixed network)

### Optimization and Upgrading

To enhance productivity and save costs in your project we offer high-quality services in optimization and upgrading.[1)]

1) For country-specific telephone numbers go to our Internet site at: http://www.siemens.com/automation/service&support

## Knowledge Base on CD-ROM


For locations without online connections to the Internet there are excerpts of the free part of the information sources available on CD-ROM (Service & Support Knowledge Base). This CD-ROM contains all the latest product information at the time of production (FAQs, Downloads, Tips and Tricks, Updates) as well as general information on Service and Technical Support.

The CD-ROM also includes a full-text search and our Knowledge Manager for targeted searches for solutions. The CD-ROM will be updated every 4 months.

Just the same as our online offer in the Internet, the Service & Support Knowledge Base on CD comes complete in 5 languages (German, English, French, Italian, Spanish).

You can order the **Service & Support Knowledge Base** CD from your Siemens contact.

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(with Automation Value Card or credit card) at:

http://www.siemens.com/automation/service&support

in the Shop domain.

## Automation Value Card


***Small card - great support***

The Automation Value Card is an integral component of the comprehensive service concept with which Siemens Automation and Drives will accompany you in each phase of your automation project.

It doesn't matter whether you want just specific services from our Technical Support or want to purchase high-quality Support Tools in our Online Shop, you can always pay with your Automation Value Card. No invoicing, transparent and safe. With your personal card number and associated PIN you can view the state of your account and all transactions at any time.

Services on card. This is how it's done.

Card number and PIN are on the back of the Automation Value Card. When delivered, the PIN is covered by a scratch field, guaranteeing that the full credit is on the card.

By entering the card number and PIN you have full access to the Service & Support services being offered. The charge for the services procured is debited from the credits on your Automation Value Card.

All the services offered are marked in currency-neutral credits, so you can use the Automation Value Card worldwide.

| **Automation Value Card order numbers** | |
|---|---|
| Credits | Order no. |
| 200 | **6ES7 997-0BA00-0XA0** |
| 500 | **6ES7 997-0BB00-0XA0** |
| 1000 | **6ES7 997-0BC00-0XA0** |
| 10000 | **6ES7 997-0BG00-0XA0** |

Detailed information on the services offered is available on our Internet site at:

http://www.siemens.com/automation/service&support

Service & Support à la Card: Examples

| **Technical Support** | |
|---|---|
| "Priority" | Priority processing for urgent cases |
| "24 h" | Availability round the clock |
| „Extended" | Technical consulting for complex questions |
| **Support Tools in the Support Shop** | |
| "System Utilities" | Tools that can be used directly for configuration, analysis and testing |
| "Applications" | Complete topic solutions including ready-tested software |
| "Functions & Samples" | Adaptable blocks for accelerating your developments |

## Overview

### *Software types*

Software requiring a license is categorized into types.
The following software types have been defined:

- Engineering software
- Runtime software

### *Engineering software*

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

### *Runtime software*

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

### *License types*

Siemens Automation & Drives offers various types of software license:

- Floating license
- Single license
- Rental license
- Trial license

### *Floating license*

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.
A license is required for each concurrent user.

### *Single license*

Unlike the floating license, a single license permits only one installation of the software.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per device, per axis, per channel, etc.

One single license is required for each type of use defined.

### *Rental license*

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific number of hours (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

### *Trial license*

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes.
It can be transferred to another license.

### *Factory license*

With the Factory License the user has the right to install and use the software at one permanent establishment only. The permanent establishment is defined by one address only.The number of hardware devices on which the software may be installed results from the order data or the Certificate of License (CoL).

### *Certificate of license*

The Certificate of License (CoL) is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

### *Downgrading*

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

### *Delivery versions*

Software is constantly being updated.
The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

### *PowerPack*

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

### *Upgrade*

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.
The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

### *ServicePack*

ServicePacks are used to debug existing products.
ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

### *License key*

Siemens Automation & Drives supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Detailed explanations concerning license conditions can be found in the “Terms and Conditions of Siemens AG” or under
http://www.siemens.com/automation/mall
(A&D Mall Online-Help System)

A&D/Software licenses/En 03.08.06

# Catalog improvement suggestions

## Fax form

**To**

**Siemens AG**
**A&D SE ITS PRI 1**
**ST 70 N - 2008/ Mr. Fregien**
**Gleiwitzer Str. 555**
**90475 Nürnberg**
**Germany**

**Fax: ++49 (911) 895-4837**

**Your adress**

Name

Job

Company/Department

Street/No.

Postal code/City

Tel. No./Fax

### Your opinion is important to us!

Our catalog should be an important and frequently used document. For this reason we are continuously endeavoring to improve it.

A small request on our part to you:
Please take time to fill in the following form and fax it to us.

Thank You!

### We invite you to grade our catalog on a point system from 1 (= good) to 6 (= poor):

- Do the contents of the catalog live up to your expectations? ☐
- Do the technical details meet your expectations? ☐
- Is the information easy to find? ☐
- How would you assess the graphics and tables? ☐
- Can the texts be readily understood? ☐

### Did you find any printing errors?

# Appendix

## Just copy this form, fill it in and fax it to us. We will deliver right away!

### Fax order form

**To:**

Fax No.

**(For address, see „Siemens contact partners“)**

Contact person

| Item | Order No. | Description | Qty. | Price | Total price |
|---|---|---|---|---|---|
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Subject to the General Conditions of Supply and Delivery specified in your sales partner's catalog and/or price list.

**Company address (company stamp)**

**Shipping address (if different)**

Customer No. (if known)

Company/Department

Company/Department

Street/No.

Street/No.

Postal code/City

Postal code/City

Contact person

Tel. No./Fax

Remarks

**Customer Order No.:**

**Deliver by**

Date

Signature

## Notes

# Terms and conditions of sale and delivery, Export regulations

## Terms and conditions of sale and delivery

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following terms. Please note! The scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside of Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following terms apply exclusively for orders placed with Siemens AG.

### *For customers with a seat or registered office in Germany*

The "General Terms of Payment" as well as the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany" shall apply.

### *For customers with a seat or registered office outside of Germany*

The "General Terms of Payment" as well as the "General Conditions for Supplies of Siemens, Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

For software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office outside of Germany" shall apply.

### *General*

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches only apply to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

The prices are in € (Euro) ex works, exclusive packaging.

The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

Surcharges will be added to the prices of products that contain silver, copper, aluminum, lead and/or gold if the respective basic official prices for these metals are exceeded. These surcharges will be determined based on the official price and the metal factor of the respective product.

The surcharge will be calculated on the basis of the official price on the day prior to receipt of the order or prior to the release order.
The metal factor determines the official price as of which the metal surcharges are charged and the calculation method used. The metal factor, provided it is relevant, is included with the price information of the respective products.

An exact explanation of the metal factor and the text of the Comprehensive Terms and Conditions of Sale and Delivery are available free of charge from your local Siemens business office under the following Order Nos.:

- 6ZB5310-0KR30-0BA1
  (for customers based in Germany)
- 6ZB5310-0KS53-0BA1
  (for customers based outside Germany)

or download them from the Internet
http://www.siemens.com/automation/mall
(Germany: A&D Mall Online-Help System)

## Export regulations

The products listed in this catalog / price list may be subject to European / German and/or US export regulations.

Therefore, any export requiring a license is subject to approval by the competent authorities.

According to current provisions, the following export regulations must be observed with respect to the products featured in this catalog / price list:

| | |
|---|---|
| AL | Number of the German Export List<br>Products marked other than "N" require an export license.<br>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.<br>Goods labeled with an "AL" not equal to "N" are subject to a European or German export authorization when being exported out of the EU. |
| ECCN | Export Control Classification Number<br>Products marked other than "N" are subject to a reexport license to specific countries.<br>In the case of software products, the export designations of the relevant data medium must also be generally adhered to.<br>Goods labeled with an "ECCN" not equal to "N" are subject to a US re-export authorization. |

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL_ohne MZ/En 05.09.06

# Catalogs of the Automation and Drives Group (A&D)

**Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partners**

| | Catalog |
|---|---|
| **Automation and Drives** | |
| Interactive catalog on CD-ROM and on DVD | |
| • The Offline Mall of Automation and Drives | CA 01 |
| **Automation Systems for Machine Tools** | |
| SINUMERIK & SIMODRIVE | NC 60 |
| SINUMERIK & SINAMICS | NC 61 |
| **Drive Systems** | |
| Variable-Speed Drives | |
| SINAMICS G110/SINAMICS G120 Inverter Chassis Units<br>SINAMICS G120D Distributed Frequency Inverters | D 11.1 |
| SINAMICS G130 Drive Converter Chassis Units,<br>SINAMICS G150 Drive Converter Cabinet Units | D 11 |
| SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converters | D 12 |
| SINAMICS S120 Drive Converter Systems | D 21.1 |
| SINAMICS S150 Drive Converter Cabinet Units | D 21.3 |
| Asynchronous Motors Standardline | D 86.1 |
| Synchronous Motors with Permanent-Magnet Technology, HT-direct | D 86.2 |
| DC Motors | DA 12 |
| SIMOREG DC MASTER 6RA70 Digital Chassis Converters | DA 21.1 |
| SIMOREG K 6RA22 Analog Chassis Converters | DA 21.2 |
| SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units | DA 22 |
| SIMOVERT PM Modular Converter Systems | DA 45 |
| SIEMOSYN Motors | DA 48 |
| MICROMASTER 410/420/430/440 Inverters | DA 51.2 |
| MICROMASTER 411/COMBIMASTER 411 | DA 51.3 |
| SIMOVERT MASTERDRIVES Vector Control | DA 65.10 |
| SIMOVERT MASTERDRIVES Motion Control | DA 65.11 |
| Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES | DA 65.3 |
| SIMODRIVE 611 universal and POSMO | DA 65.4 |
| Low-Voltage Three-Phase-Motors | |
| IEC Squirrel-Cage Motors | D 81.1 |
| IEC Squirrel-Cage Motors · New Generation 1LE1 | D 81.1 N |
| *PDF: Geared Motors* | *M 15* |
| Automation Systems for Machine Tools SIMODRIVE | NC 60 |
| • Main Spindle/Feed Motors | |
| • Converter Systems SIMODRIVE 611/POSMO | |
| Automation Systems for Machine Tools SINAMICS | NC 61 |
| • Main Spindle/Feed Motors | |
| • Drive System SINAMICS S120 | |
| Drive and Control Components for Hoisting Equipment | HE 1 |
| **Electrical Installation Technology** | |
| *PDF: ALPHA Small Distribution Boards and Distribution Boards, Terminal Blocks* | *ET A1* |
| *PDF: ALPHA 8HP Molded-Plastic Distribution System* | *ET A3* |
| *PDF: BETA Low-Voltage Circuit Protection* | *ET B1* |
| *PDF: DELTA Switches and Socket Outlets* | *ET D1* |
| GAMMA Building Controls | ET G1 |
| **Human Machine Interface Systems SIMATIC HMI** | ST 80 |

| | Catalog |
|---|---|
| **Industrial Communication for Automation and Drives** | IK PI |
| **Low-Voltage** | |
| Controls and Distribution – SIRIUS, SENTRON, SIVACON | LV 1 |
| Controls and Distribution – Technical Information SIRIUS, SENTRON, SIVACON | LV 1 T |
| SIDAC Reactors and Filters | LV 60 |
| SIVENT Fans | LV 65 |
| SIVACON 8PS Busbar Trunking Systems | LV 70 |
| **Motion Control System SIMOTION** | PM 10 |
| **Process Instrumentation and Analytics** | |
| Field Instruments for Process Automation Measuring Instruments for Pressure, Differential Pressure, Flow, Level and Temperature, Positioners and Liquid Meters | FI 01 |
| *PDF: Indicators for panel mounting* | *MP 12* |
| SIREC Recorders and Accessories | MP 20 |
| SIPART, Controllers and Software | MP 31 |
| SIWAREX Weighing Systems | WT 01 |
| Continuous Weighing and Process Protection | WT 02 |
| Process Analytical Instruments | PA 01 |
| *PDF: Process Analytics, Components for the System Integration* | *PA 11* |
| **SIMATIC Industrial Automation Systems** | |
| SIMATIC PCS Process Control System | ST 45 |
| Products for Totally Integrated Automation and Micro Automation | ST 70 |
| SIMATIC PCS 7 Process Control System | ST PCS 7 |
| Add-ons for the SIMATIC PCS 7 Process Control System | ST PCS 7.1 |
| Migration solutions with the SIMATIC PCS 7 Process Control System | ST PCS 7.2 |
| pc-based Automation | ST PC |
| SIMATIC Control Systems | ST DA |
| **SIMATIC Sensors** | |
| Sensors for Factory Automation | FS 10 |
| **Systems Engineering** | |
| Power supplies SITOP power | KT 10.1 |
| System cabling SIMATIC TOP connect | KT 10.2 |
| **System Solutions** | |
| Applications and Products for Industry are part of the interactive catalog CA 01 | |
| **TELEPERM M Process Control System** | |
| *PDF: AS 488/TM automation systems* | *PLT 112* |

*PDF: These catalogs are only available as pdf files.*

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**Order No. E86060-K4670-A151-A3-7600**