

# SIEMENS



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## SIMATIC S7-400 advanced controller

**6/2 Central processing units**Standard CPUs

6/2 CPU 412

6/6 CPU 414

6/11 CPU 416

6/16 CPU 417

Fail-safe CPUs

6/19 CPU 414F

6/23 CPU 416F

High-availability CPUs

6/27 Y-link for S7-400H

SIPLUS high-availability CPUs

6/29 SIPLUS Y-Link for S7-400H

**6/31 Function modules**6/31 FM 458-1 DP application module

6/31 D7-SYS

**Brochures**

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

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## SIMATIC S7-400 advanced controller

Central processing units  
Standard CPUs

### 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

Article number	6ES7412-1XJ07-0AB0	6ES7412-2XK07-0AB0	6ES7412-2EK07-0AB0
	CPU412-1, MPI/DP, 512 KB	CPU412-2, MPI/DP, 1 MB	CPU412-2 PN, 1 MB, 2 INTERFACES
<b>General information</b>			
Product type designation	CPU 412-1	CPU 412-2	CPU 412-2 PN
<b>Engineering with</b>			
• Programming package	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.5 or higher with HSP 262
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
<b>Power loss</b>			
Power loss, typ.	3.5 W	4.5 W	5.5 W
<b>Memory</b>			
<b>Work memory</b>			
• integrated	512 kbyte	1 Mbyte	1 Mbyte
• integrated (for program)	256 kbyte	512 kbyte	512 kbyte
• integrated (for data)	256 kbyte	512 kbyte	512 kbyte
<b>Load memory</b>			
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
• integrated RAM, max.	512 kbyte	512 kbyte	512 kbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	31.25 ns	31.25 ns	31.25 ns
for word operations, typ.	31.25 ns	31.25 ns	31.25 ns
for fixed point arithmetic, typ.	31.25 ns	31.25 ns	31.25 ns
for floating point arithmetic, typ.	62.5 ns	62.5 ns	62.5 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area

## Technical specifications (continued)

Article number	<b>6ES7412-1XJ07-0AB0</b>	<b>6ES7412-2XK07-0AB0</b>	<b>6ES7412-2EK07-0AB0</b>
	CPU412-1, MPI/DP, 512 KB	CPU412-2, MPI/DP, 1 MB	CPU412-2 PN, 1 MB, 2 INTERFACES
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	4 kbyte	4 kbyte	4 kbyte
• Outputs	4 kbyte	4 kbyte	4 kbyte
<b>Process image</b>			
• Inputs, adjustable	4 kbyte	4 kbyte	4 kbyte
• Outputs, adjustable	4 kbyte	4 kbyte	4 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	16	16	16
<b>Interfaces</b>			
Interfaces/bus type	1 x MPI/PROFIBUS DP	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports)
Number of RS 485 interfaces	1; Combined MPI / PROFIBUS DP	2; Combined MPI / PROFIBUS DP and PROFIBUS DP	1; Combined MPI / PROFIBUS DP
<b>1. Interface</b>			
Interface type	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.	32	32	32
<b>2. Interface</b>			
Interface type		Integrated	PROFINET
Physics		RS 485 / PROFIBUS	Ethernet RJ45
<b>Interface types</b>			
• Number of ports			2
<b>Functionality</b>			
• DP master		Yes	No
• DP slave		Yes	No
• PROFINET IO Controller			Yes
• PROFINET IO Device			Yes
• PROFINET CBA			Yes
<b>DP master</b>			
• Number of DP slaves, max.		64	
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5 compatible communication</b>			
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>			
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 412****Technical specifications (continued)**

Article number	<b>6ES7412-1XJ07-0AB0</b>	<b>6ES7412-2XK07-0AB0</b>	<b>6ES7412-2EK07-0AB0</b>
	CPU412-1, MPI/DP, 512 KB	CPU412-2, MPI/DP, 1 MB	CPU412-2 PN, 1 MB, 2 INTERFACES
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs 46
- Number of connections, max.			46
• ISO-on-TCP (RFC1006)	Via CP 443-1 Adv. and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs 46
- Number of connections, max.			46
• UDP			Yes; via integrated PROFINET interface and loadable FBs 46
- Number of connections, max.			46
<b>Web server</b>			
• supported	No	No	Yes
<b>Number of connections</b>			
• overall	48	48	48
<b>Standards, approvals, certificates</b>			
<b>Use in hazardous areas</b>			
• ATEX	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
<b>Weights</b>			
Weight, approx.	700 g	700 g	750 g

Ordering data	Article No.	Article No.
<b>CPU 412-1</b> Work memory 512 KB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7412-1XJ07-0AB0	
<b>CPU 412-2</b> Work memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7412-2XK07-0AB0	
<b>CPU 412-2 PN</b> Work memory 1 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, slot for memory card, incl. slot number labels	6ES7412-2EK07-0AB0	
<b>RAM memory card</b> • 64 KB • 256 KB • 1 MB • 2 MB • 4 MB • 8 MB • 16 MB • 64 MB	6ES7952-0AF00-0AA0 6ES7952-1AH00-0AA0 6ES7952-1AK00-0AA0 6ES7952-1AL00-0AA0 6ES7952-1AM00-0AA0 6ES7952-1AP00-0AA0 6ES7952-1AS00-0AA0 6ES7952-1AY00-0AA0	
<b>FEPROM memory card</b> • 64 KB • 256 KB • 1 MB • 2 MB • 4 MB • 8 MB • 16 MB • 32 MB • 64 MB	6ES7952-0KF00-0AA0 6ES7952-0KH00-0AA0 6ES7952-1KK00-0AA0 6ES7952-1KL00-0AA0 6ES7952-1KM00-0AA0 6ES7952-1KP00-0AA0 6ES7952-1KS00-0AA0 6ES7952-1KT00-0AA0 6ES7952-1KY00-0AA0	
<b>MPI cable</b> For connection of SIMATIC S7 and PG via MPI; length: 5 m	6ES7901-0BF00-0AA0	
<b>Slot number labels</b> 1 set (spare part)	6ES7912-0AA00-0AA0	
<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0	
<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2	
		<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbps • Without PG interface • With PG interface
		6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
		<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbps • Without PG interface • With PG interface
		6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0
		<b>RS 485 bus connector with 90° cable outlet for FastConnect system</b> Max. transfer rate 12 Mbps • Without PG interface - 1 unit - 100 units • With PG interface - 1 unit - 100 units
		6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0  6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0
		<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS
		6GK1500-0EA02
		<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m
		6XV1830-0EH10

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**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**

Article number	<b>6ES7414-2XL07-0AB0</b> CPU414-2, MPI/DP, 2 MB	<b>6ES7414-3XM07-0AB0</b> CPU414-3, 4 MB, 3 INTERFACES	<b>6ES7414-3EM07-0AB0</b> CPU414-3 PN/DP, 4 MB, 3 INTERFACES
<b>General information</b>			
Product type designation	CPU 414-2	CPU 414-3	CPU414-3 PN/DP
<b>Engineering with</b>			
• Programming package	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.5 or higher with HSP 262
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
<b>Power loss</b>			
Power loss, typ.	4.5 W	5.5 W	6.5 W
<b>Memory</b>			
<b>Work memory</b>			
• integrated	2 Mbyte	4 Mbyte	4 Mbyte
• integrated (for program)	1 Mbyte	2 Mbyte	2 Mbyte
• integrated (for data)	1 Mbyte	2 Mbyte	2 Mbyte
<b>Load memory</b>			
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
• integrated RAM, max.	512 kbyte	512 kbyte	512 kbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	18.75 ns	18.75 ns	18.75 ns
for word operations, typ.	18.75 ns	18.75 ns	18.75 ns
for fixed point arithmetic, typ.	18.75 ns	18.75 ns	18.75 ns
for floating point arithmetic, typ.	37.5 ns	37.5 ns	37.5 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area

6

## Technical specifications (continued)

Article number	6ES7414-2XL07-0AB0 CPU414-2, MPI/DP, 2 MB	6ES7414-3XM07-0AB0 CPU414-3, 4 MB, 3 INTERFACES	6ES7414-3EM07-0AB0 CPU414-3 PN/DP, 4 MB, 3 INTERFACES
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	8 kbyte	8 kbyte	8 kbyte
• Outputs	8 kbyte	8 kbyte	8 kbyte
<b>Process image</b>			
• Inputs, adjustable	8 kbyte	8 kbyte	8 kbyte
• Outputs, adjustable	8 kbyte	8 kbyte	8 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	16	16	16
<b>Interfaces</b>			
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 1 x PROFIBUS DP (optionally pluggable)	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2; Combined MPI / PROFIBUS DP and PROFIBUS DP	2; Combined MPI / PROFIBUS DP and PROFIBUS DP	1; Combined MPI / PROFIBUS DP
Number of other interfaces		1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)	1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)
<b>1. Interface</b>			
Interface type	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.	32	32	32
<b>2. Interface</b>			
Interface type	Integrated	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	Ethernet RJ45
<b>Interface types</b>			
• Number of ports			2
<b>Functionality</b>			
• DP master	Yes	Yes	No
• DP slave	Yes	Yes	No
• PROFINET IO Controller			Yes
• PROFINET IO Device			Yes
• PROFINET CBA			Yes
<b>DP master</b>			
• Number of DP slaves, max.	96	96	
<b>3. Interface</b>			
Interface type		Pluggable interface module (IF), technical data as for 2nd interface	Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS	RS 485 / PROFIBUS
<b>Functionality</b>			
• MPI		No	No
• DP master		Yes	Yes
• DP slave		Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.		96	96



**SIMATIC S7-400 advanced controller**Central processing units  
Standard CPUs**CPU 414****Technical specifications (continued)**

Article number	<b>6ES7414-2XL07-0AB0</b> CPU414-2, MPI/DP, 2 MB	<b>6ES7414-3XM07-0AB0</b> CPU414-3, 4 MB, 3 INTERFACES	<b>6ES7414-3EM07-0AB0</b> CPU414-3 PN/DP, 4 MB, 3 INTERFACES
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5 compatible communication</b>			
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>			
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			62
• ISO-on-TCP (RFC1006)	Via CP 443-1 and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
- Number of connections, max.			62
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			62
<b>Web server</b>			
• supported	No	No	Yes
<b>Number of connections</b>			
• overall	64	64	64
<b>Standards, approvals, certificates</b>			
<b>Use in hazardous areas</b>			
• ATEX	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	25 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
<b>Weights</b>			
Weight, approx.	700 g	900 g	900 g

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 414-2</b> Work memory 2 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7414-2XL07-0AB0	<b>Slot number labels</b> 1 set (spare part)	6ES7912-0AA00-0AA0
<b>CPU 414-3</b> Work memory 4 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	6ES7414-3XM07-0AB0	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>CPU 414-3 PN/DP</b> Work memory 4 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	6ES7414-3EM07-0AB0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2
<b>RAM memory card</b> • 64 KB • 256 KB • 1 MB • 2 MB • 4 MB • 8 MB • 16 MB • 64 MB	6ES7952-0AF00-0AA0 6ES7952-1AH00-0AA0 6ES7952-1AK00-0AA0 6ES7952-1AL00-0AA0 6ES7952-1AM00-0AA0 6ES7952-1AP00-0AA0 6ES7952-1AS00-0AA0 6ES7952-1AY00-0AA0	<b>PROFIBUS bus components</b>	
<b>FEPRM memory card</b> • 64 KB • 256 KB • 1 MB • 2 MB • 4 MB • 8 MB • 16 MB • 32 MB • 64 MB	6ES7952-0KF00-0AA0 6ES7952-0KH00-0AA0 6ES7952-1KK00-0AA0 6ES7952-1KL00-0AA0 6ES7952-1KM00-0AA0 6ES7952-1KP00-0AA0 6ES7952-1KS00-0AA0 6ES7952-1KT00-0AA0 6ES7952-1KY00-0AA0	<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbps • Without PG interface • With PG interface	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
<b>MPI cable</b> for connection of SIMATIC S7 and PG via MPI; length: 5 m	6ES7901-0BF00-0AA0	<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbps • Without PG interface • With PG interface	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0
<b>IF 964-DP interface module</b> For connecting an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4	6ES7964-2AA04-0AB0	<b>RS 485 bus connector with 90° cable outlet for FastConnect connection system</b> Max. transfer rate 12 Mbps • Without PG interface - 1 unit - 100 units • With PG interface - 1 unit - 100 units	6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0
		<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	6GK1500-0EA02
		<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m	6XV1830-0EH10

**SIMATIC S7-400 advanced controller**

Central processing units

Standard CPUs

**CPU 414**

<b>Ordering data</b>	<b>Article No.</b>	<b>Article No.</b>
<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	<b>6ES7972-0AA02-0XA0</b>	
<b>PROFINET bus components</b>		
<b>IE FC TP standard cable GP 2x2</b> 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	<b>6XV1840-2AH10</b>	
<b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>	
<b>SCALANCE X204-2 Industrial Ethernet Switch</b> Industrial Ethernet Switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configur- ing line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	
		<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables
		<b>IE FC RJ45 Plug 180</b> 180° cable outlet <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>
		<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/ PROFINET communication
		<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
		See catalogs IK PI, CA 01

**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**

Article number	<b>6ES7416-2XP07-0AB0</b> CPU 416-2, MPI, PROFIBUS, 8 MB	<b>6ES7416-3XS07-0AB0</b> CPU 416-3, 16 MB, 3 INTERFACES	<b>6ES7416-3ES07-0AB0</b> CPU416-3 PN/DP, 16 MB, 3 INTERFACES
<b>General information</b>			
Product type designation	CPU 416-2	CPU 416-3	CPU416-3 PN/DP
<b>Engineering with</b>			
• Programming package	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.5 or higher with HSP 262
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply	No; Power supply via system power supply
<b>Power loss</b>			
Power loss, typ.	4.5 W	5.5 W	6.5 W
<b>Memory</b>			
<b>Work memory</b>			
• integrated	8 Mbyte	16 Mbyte	16 Mbyte
• integrated (for program)	4 Mbyte	8 Mbyte	8 Mbyte
• integrated (for data)	4 Mbyte	8 Mbyte	8 Mbyte
<b>Load memory</b>			
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
• integrated RAM, max.	1 Mbyte	1 Mbyte	1 Mbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte	64 Mbyte
<b>CPU processing times</b>			
for bit operations, typ.	12.5 ns	12.5 ns	12.5 ns
for word operations, typ.	12.5 ns	12.5 ns	12.5 ns
for fixed point arithmetic, typ.	12.5 ns	12.5 ns	12.5 ns
for floating point arithmetic, typ.	25 ns	25 ns	25 ns
<b>Counters, timers and their retentivity</b>			
<b>S7 counter</b>			
• Number	2 048	2 048	2 048
<b>IEC counter</b>			
• present	Yes	Yes	Yes
<b>S7 times</b>			
• Number	2 048	2 048	2 048
<b>IEC timer</b>			
• present	Yes	Yes	Yes
<b>Data areas and their retentivity</b>			
<b>Flag</b>			
• Number, max.	16 kbyte; Size of bit memory address area	16 kbyte; Size of bit memory address area	16 kbyte; Size of bit memory address area

**SIMATIC S7-400 advanced controller**Central processing units  
Standard CPUs**CPU 416****Technical specifications (continued)**

Article number	<b>6ES7416-2XP07-0AB0</b> CPU 416-2, MPI, PROFIBUS, 8 MB	<b>6ES7416-3XS07-0AB0</b> CPU 416-3, 16 MB, 3 INTERFACES	<b>6ES7416-3ES07-0AB0</b> CPU416-3 PN/DP, 16 MB, 3 INTERFACES
<b>Address area</b>			
<b>I/O address area</b>			
• Inputs	16 kbyte	16 kbyte	16 kbyte
• Outputs	16 kbyte	16 kbyte	16 kbyte
<b>Process image</b>			
• Inputs, adjustable	16 kbyte	16 kbyte	16 kbyte
• Outputs, adjustable	16 kbyte	16 kbyte	16 kbyte
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time clock)	Yes	Yes	Yes
<b>Operating hours counter</b>			
• Number	16	16	16
<b>Interfaces</b>			
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 1 x PROFIBUS DP (optionally pluggable)	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2; Combined MPI / PROFIBUS DP and PROFIBUS DP	2; Combined MPI / PROFIBUS DP and PROFIBUS DP	1; Combined MPI / PROFIBUS DP
Number of other interfaces		1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)	1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)
<b>1. Interface</b>			
Interface type	Integrated	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>			
• MPI	Yes	Yes	Yes
• DP master	Yes	Yes	Yes
• DP slave	Yes	Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.	32	32	32
<b>2. Interface</b>			
Interface type	Integrated	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	RS 485 / PROFIBUS	Ethernet RJ45
<b>Interface types</b>			
• Number of ports			2
<b>Functionality</b>			
• DP master	Yes	Yes	No
• DP slave	Yes	Yes	No
• PROFINET IO Controller			Yes
• PROFINET IO Device			Yes
• PROFINET CBA			Yes
<b>DP master</b>			
• Number of DP slaves, max.	125	125	
<b>3. Interface</b>			
Interface type		Pluggable interface module (IF), technical data as for 2nd interface	Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS	RS 485 / PROFIBUS
<b>Functionality</b>			
• MPI		No	No
• DP master		Yes	Yes
• DP slave		Yes	Yes
<b>DP master</b>			
• Number of DP slaves, max.		125	125

6

**Technical specifications (continued)**

Article number	<b>6ES7416-2XP07-0AB0</b> CPU 416-2, MPI, PROFIBUS, 8 MB	<b>6ES7416-3XS07-0AB0</b> CPU 416-3, 16 MB, 3 INTERFACES	<b>6ES7416-3ES07-0AB0</b> CPU416-3 PN/DP, 16 MB, 3 INTERFACES
<b>Isochronous mode</b>			
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
<b>Global data communication</b>			
• supported	Yes	Yes	Yes
<b>S7 basic communication</b>			
• supported	Yes	Yes	Yes
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
<b>S5 compatible communication</b>			
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>			
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB
<b>Open IE communication</b>			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			94
• ISO-on-TCP (RFC1006)	Via CP 443-1 and loadable FB	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
- Number of connections, max.			94
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			94
<b>Web server</b>			
• supported	No	No	Yes
<b>Number of connections</b>			
• overall	96	96	96
<b>Standards, approvals, certificates</b>			
<b>Use in hazardous areas</b>			
• ATEX	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc
<b>Ambient conditions</b>			
<b>Ambient temperature during operation</b>			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>			
Width	25 mm	50 mm	50 mm
Height	290 mm	290 mm	290 mm
Depth	219 mm	219 mm	219 mm
<b>Weights</b>			
Weight, approx.	700 g	900 g	900 g

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 416****Ordering data****Article No.****Article No.****CPU 416-2**

Work memory 8 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels

**6ES7416-2XP07-0AB0****CPU 416-3**

Work memory 16 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

**6ES7416-3XS07-0AB0****CPU 416-3 PN/DP**

Work memory 16 MB, power supply 24 V DC, MPI/PROFIBUS DP master interface, PROFINET interface, PROFIBUS DP master interface, module slot for 1 IF module, slot for memory card, incl. slot number labels

**6ES7416-3ES07-0AB0****RAM memory card**

- 64 KB
- 256 KB
- 1 MB
- 2 MB
- 4 MB
- 8 MB
- 16 MB
- 64 MB

**6ES7952-0AF00-0AA0**  
**6ES7952-1AH00-0AA0**  
**6ES7952-1AK00-0AA0**  
**6ES7952-1AL00-0AA0**  
**6ES7952-1AM00-0AA0**  
**6ES7952-1AP00-0AA0**  
**6ES7952-1AS00-0AA0**  
**6ES7952-1AY00-0AA0**

**FEEPROM memory card**

- 64 KB
- 256 KB
- 1 MB
- 2 MB
- 4 MB
- 8 MB
- 16 MB
- 32 MB
- 64 MB

**6ES7952-0KF00-0AA0**  
**6ES7952-0KH00-0AA0**  
**6ES7952-1KK00-0AA0**  
**6ES7952-1KL00-0AA0**  
**6ES7952-1KM00-0AA0**  
**6ES7952-1KP00-0AA0**  
**6ES7952-1KS00-0AA0**  
**6ES7952-1KT00-0AA0**  
**6ES7952-1KY00-0AA0**

**MPI cable**

For connection of SIMATIC S7 and PG via MPI; length: 5 m

**6ES7901-0BF00-0AA0****IF 964-DP interface module**

For connecting an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4

**6ES7964-2AA04-0AB0****Slot number labels**

1 set (spare part)

**6ES7912-0AA00-0AA0****SIMATIC Manual Collection**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2****PROFIBUS bus components****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0**  
**6ES7972-0BB12-0XA0**

**RS 485 bus connector with angled cable outlet**

Max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

**6ES7972-0BA42-0XA0**  
**6ES7972-0BB42-0XA0**

**RS 485 bus connector with 90° cable outlet for FastConnect connection system**

Max. transfer rate 12 Mbps

- Without PG interface
  - 1 unit
  - 100 units
- With PG interface
  - 1 unit
  - 100 units

**6ES7972-0BA52-0XA0**  
**6ES7972-0BA52-0XB0**

**6ES7972-0BB52-0XA0**  
**6ES7972-0BB52-0XB0**

Ordering data	Article No.	Ordering data	Article No.
<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	<b>6GK1500-0EA02</b>	<b>SCALANCE X204-2 Industrial Ethernet Switch</b> 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 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>
<b>PROFIBUS FastConnect bus cable</b> Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m	<b>6XV1830-0EH10</b>	<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	<b>6ES7972-0AA02-0XA0</b>	<b>IE FC RJ45 Plug 180</b> 180° cable outlet • 1 unit • 10 units • 50 units	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
<b>PROFINET bus components</b>		<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See catalogs IK PI, CA 01
<b>IE FC TP standard cable GP 2x2</b> 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	<b>6XV1840-2AH10</b>		
<b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter	<b>6XV1873-2A</b>		



# SIMATIC S7-400 advanced controller

Central processing units  
Standard CPUs

## CPU 417

### 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

Article number	<b>6ES7417-4XT07-0AB0</b> CPU 417-4, 32 MB, 4 INTERFACES
<b>General information</b>	
Product type designation	CPU 417-4
<b>Engineering with</b>	
• Programming package	STEP 7 V5.4 or higher with HSP 261
<b>Supply voltage</b>	
Rated value (DC)	No; Power supply via system power supply
• 24 V DC	
<b>Power loss</b>	
Power loss, typ.	6.5 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated	32 Mbyte
• integrated (for program)	16 Mbyte
• integrated (for data)	16 Mbyte
<b>Load memory</b>	
• expandable FEPRM, max.	64 Mbyte
• integrated RAM, max.	1 Mbyte
• expandable RAM, max.	64 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	7.5 ns
for word operations, typ.	7.5 ns
for fixed point arithmetic, typ.	7.5 ns
for floating point arithmetic, typ.	15 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	2 048
<b>IEC timer</b>	
• present	Yes
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	16 kbyte; Size of bit memory address area

Article number	<b>6ES7417-4XT07-0AB0</b> CPU 417-4, 32 MB, 4 INTERFACES
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	16 kbyte
• Outputs	16 kbyte
<b>Process image</b>	
• Inputs, adjustable	16 kbyte
• Outputs, adjustable	16 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	16
<b>Interfaces</b>	
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 2 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2; Combined MPI / PROFIBUS DP and PROFIBUS DP
Number of other interfaces	2; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)
<b>1. Interface</b>	
Interface type	Integrated
Physics	RS 485 / PROFIBUS + MPI
<b>Functionality</b>	
• MPI	Yes
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	32
<b>2. Interface</b>	
Interface type	Integrated
Physics	RS 485 / PROFIBUS

## Technical specifications (continued)

Article number	<b>6ES7417-4XT07-0AB0</b> CPU 417-4, 32 MB, 4 INTERFACES
<b>Functionality</b>	
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	125
<b>3. Interface</b>	
Interface type	Pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics	RS 485 / PROFIBUS
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	125
<b>4. Interface</b>	
Interface type	Pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes

Article number	<b>6ES7417-4XT07-0AB0</b> CPU 417-4, 32 MB, 4 INTERFACES
<b>S5 compatible communication</b>	
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>	
• supported	Yes; Via CP and loadable FB
<b>Open IE communication</b>	
• ISO-on-TCP (RFC1006)	Via CP 443-1 and loadable FB
<b>Web server</b>	
• supported	No
<b>Number of connections</b>	
• overall	120
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• ATEX	ATEX II 3 G Ex nA IIC T4 Gc
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Configuration</b>	
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	219 mm
<b>Weights</b>	
Weight, approx.	900 g

## Ordering data

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 417-4</b> Work 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	<b>6ES7417-4XT07-0AB0</b>	<b>FEPROM memory card</b>	
<b>RAM memory card</b>		• 64 KB	<b>6ES7952-0KF00-0AA0</b>
• 64 KB	<b>6ES7952-0AF00-0AA0</b>	• 256 KB	<b>6ES7952-0KH00-0AA0</b>
• 256 KB	<b>6ES7952-1AH00-0AA0</b>	• 1 MB	<b>6ES7952-1KK00-0AA0</b>
• 1 MB	<b>6ES7952-1AK00-0AA0</b>	• 2 MB	<b>6ES7952-1KL00-0AA0</b>
• 2 MB	<b>6ES7952-1AL00-0AA0</b>	• 4 MB	<b>6ES7952-1KM00-0AA0</b>
• 4 MB	<b>6ES7952-1AM00-0AA0</b>	• 8 MB	<b>6ES7952-1KP00-0AA0</b>
• 8 MB	<b>6ES7952-1AP00-0AA0</b>	• 16 MB	<b>6ES7952-1KS00-0AA0</b>
• 16 MB	<b>6ES7952-1AS00-0AA0</b>	• 32 MB	<b>6ES7952-1KT00-0AA0</b>
• 64 MB	<b>6ES7952-1AY00-0AA0</b>	• 64 MB	<b>6ES7952-1KY00-0AA0</b>
		<b>MPI cable</b>	<b>6ES7901-0BF00-0AA0</b>
		For connection of SIMATIC S7 and PG via MPI; length: 5 m	

**SIMATIC S7-400 advanced controller**

Central processing units  
Standard CPUs

**CPU 417****Ordering data****Article No.****IF 964-DP interface module**

For connecting an additional DP line; for CPU 414-3, CPU 414-3 PN/DP, CPU 416-3, CPU 416-3 PN/DP, CPU 417-4

**6ES7964-2AA04-0AB0****Slot number labels**

1 set (spare part)

**6ES7912-0AA00-0AA0****SIMATIC Manual Collection**

Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC

**6ES7998-8XC01-8YE0****SIMATIC Manual Collection update service for 1 year**

Current "Manual Collection" DVD and the three subsequent updates

**6ES7998-8XC01-8YE2****RS 485 bus connector with 90° cable outlet**

Max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

**6ES7972-0BA12-0XA0**  
**6ES7972-0BB12-0XA0****RS 485 bus connector with angled cable outlet**

Max. transfer rate 12 Mbps

- Without PG interface
- With PG interface

**6ES7972-0BA42-0XA0**  
**6ES7972-0BB42-0XA0****RS 485 bus connector with 90° cable outlet for FastConnect connection system**

Max. transfer rate 12 Mbps

- Without PG interface
  - 1 unit
  - 100 units
- With PG interface
  - 1 unit
  - 100 units

**6ES7972-0BA52-0XA0**  
**6ES7972-0BA52-0XB0****6ES7972-0BB52-0XA0**  
**6ES7972-0BB52-0XB0****RS 485 bus connector with axial cable outlet**

For SIMATIC OP, for connection to PPI, MPI, PROFIBUS

**6GK1500-0EA02****PROFIBUS FastConnect bus cable**

Standard type with special design for fast mounting, 2-core, shielded, cut-to-length; max. delivery unit 1 000 m, minimum ordering quantity 20 m

**6XV1830-0EH10**

6

**Overview**

- For constructing a fail-safe automation system for plants with increased safety requirements
- CPUs for high demands in the mid-level performance range
- Applicable for plants with additional demands on programming scope and processing speed
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Standard and safety-related tasks can be performed with a single CPU
- Integrated PROFINET functions with CPU 414F-3 PN/DP
- Multi-processor mode is possible
- Safety-related communication with distributed I/O devices over PROFIBUS DP or PROFINET IO with PROFIsafe profile
- Fail-safe I/O modules can be connected in a distributed manner via the integrated interfaces (DP and PN with CPU 414F-3 PN/DP) and/or through communication modules (CP 443-5 Extended and CP 443-1 Advanced)
- Central and distributed use of standard modules for non-safety-oriented applications

**Technical specifications**

Article number	<b>6ES7414-3FM07-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>General information</b>	
Product type designation	CPU414F-3 PN/DP
<b>Engineering with</b>	
• Programming package	STEP 7 V5.5 or higher with HSP 262
<b>Supply voltage</b>	
Rated value (DC)	No; Power supply via system power supply
• 24 V DC	
<b>Power loss</b>	
Power loss, typ.	6.5 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated	4 Mbyte
• integrated (for program)	2 Mbyte
• integrated (for data)	2 Mbyte
<b>Load memory</b>	
• expandable FEPRAM, max.	64 Mbyte
• integrated RAM, max.	512 kbyte
• expandable RAM, max.	64 Mbyte
<b>CPU processing times</b>	
for bit operations, typ.	18.75 ns
for word operations, typ.	18.75 ns
for fixed point arithmetic, typ.	18.75 ns
for floating point arithmetic, typ.	37.5 ns
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	2 048
<b>IEC counter</b>	
• present	Yes
<b>S7 times</b>	
• Number	2 048

Article number	<b>6ES7414-3FM07-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>IEC timer</b>	
• present	Yes
<b>Data areas and their retentivity</b>	
<b>Flag</b>	
• Number, max.	8 kbyte; Size of bit memory address area
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	8 kbyte
• Outputs	8 kbyte
<b>Process image</b>	
• Inputs, adjustable	8 kbyte
• Outputs, adjustable	8 kbyte
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time clock)	Yes
<b>Operating hours counter</b>	
• Number	16
<b>Interfaces</b>	
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	1; Combined MPI / PROFIBUS DP
Number of other interfaces	1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)
<b>1. Interface</b>	
Interface type	Integrated
Physics	RS 485 / PROFIBUS + MPI

**SIMATIC S7-400 advanced controller**

Central processing units  
Fail-safe CPUs

**CPU 414F****Technical specifications (continued)**

Article number	<b>6ES7414-3FM07-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>Functionality</b>	
• MPI	Yes
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	32
<b>2. Interface</b>	
Interface type	PROFINET
Physics	Ethernet RJ45
<b>Interface types</b>	
• Number of ports	2
<b>Functionality</b>	
• DP master	No
• DP slave	No
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• PROFINET CBA	Yes
<b>3. Interface</b>	
Interface type	Pluggable interface module (IF)
Plug-in interface modules	IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics	RS 485 / PROFIBUS
<b>Functionality</b>	
• MPI	No
• DP master	Yes
• DP slave	Yes
<b>DP master</b>	
• Number of DP slaves, max.	96
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
• supported	Yes
<b>S7 basic communication</b>	
• supported	Yes
<b>S7 communication</b>	
• supported	Yes
<b>S5 compatible communication</b>	
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>	
• supported	Yes; Via CP and loadable FB

Article number	<b>6ES7414-3FM07-0AB0</b> CPU414F-3 PN/DP, 4 MB, 3 INTERFACES
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	62
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 Adv. and loadable FBs
- Number of connections, max.	62
• UDP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	62
<b>Web server</b>	
• supported	Yes
<b>Number of connections</b>	
• overall	64
<b>Standards, approvals, certificates</b>	
<b>Use in hazardous areas</b>	
• ATEX	ATEX II 3 G Ex nA IIC T4 Gc
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Configuration</b>	
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	50 mm
Height	290 mm
Depth	219 mm
<b>Weights</b>	
Weight, approx.	900 g

Ordering data	Article No.	Article No.
<b>CPU 414F-3 PN/DP</b> For setting up safety-related automation systems; work memory 4 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	6ES7414-3FM07-0AB0	<b>IF 964-DP interface module</b> For connecting an additional DP line
<b>Distributed Safety V5.4 programming tool</b> Task: Engineering tool for configuring failsafe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 or higher • Floating License • Floating License for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5	<b>Slot number labels</b> 1 set (spare part)
<b>Distributed Safety Upgrade</b> From V5.x to V5.4; Floating License for 1 user	6ES7833-1FC02-0YE5	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC
<b>STEP 7 Safety Advanced V13</b> Task: Engineering tool for configuring failsafe user programs for SIMATIC S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 • Floating License for 1 user • Floating License for 1 user, license key download without software or documentation <sup>1)</sup> ; e-mail address required for delivery	6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates
<b>RAM memory card</b> • 64 KB • 256 KB • 1 MB • 2 MB • 4 MB • 8 MB • 16 MB • 64 MB	6ES7952-0AF00-0AA0 6ES7952-1AH00-0AA0 6ES7952-1AK00-0AA0 6ES7952-1AL00-0AA0 6ES7952-1AM00-0AA0 6ES7952-1AP00-0AA0 6ES7952-1AS00-0AA0 6ES7952-1AY00-0AA0	<b>PROFIBUS bus components</b> <b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbps • Without PG interface • With PG interface
<b>FEPRM memory card</b> • 64 KB • 256 KB • 1 MB • 2 MB • 4 MB • 8 MB • 16 MB • 32 MB • 64 MB	6ES7952-0KF00-0AA0 6ES7952-0KH00-0AA0 6ES7952-1KK00-0AA0 6ES7952-1KL00-0AA0 6ES7952-1KM00-0AA0 6ES7952-1KP00-0AA0 6ES7952-1KS00-0AA0 6ES7952-1KT00-0AA0 6ES7952-1KY00-0AA0	<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbps • Without PG interface • With PG interface
<b>MPI cable</b> For connection of SIMATIC S7 and PG via MPI; length: 5 m	6ES7901-0BF00-0AA0	<b>RS 485 bus connector with 90° cable outlet for FastConnect connection system</b> Max. transfer rate 12 Mbps • Without PG interface - 1 unit - 100 units • With PG interface - 1 unit - 100 units
		<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS
		<b>PROFIBUS FastConnect bus cable</b> 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
		<b>RS 485 repeater for PROFIBUS</b> Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure
		<b>PROFINET bus components</b> <b>IE FC TP standard cable GP 2x2</b> 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; max. delivery unit 1000 m, minimum ordering quantity 20 m

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 414F**

<b>Ordering data</b>	<b>Article No.</b>		<b>Article No.</b>
<b>FO standard cable GP (50/125)</b> Standard cable, splittable, UL approval, sold by the meter: max. delivery unit 1 000 m, minimum ordering quantity 20 m	<b>6XV1873-2A</b>	<b>IE FC RJ45 plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
<b>SCALANCE X204-2 Industrial Ethernet Switch</b> 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 Mbps RJ45 ports and two FO ports	<b>6GK5204-2BB10-2AA3</b>	<b>IE FC RJ45 Plug 180</b> 180° cable outlet <ul style="list-style-type: none"> <li>• 1 unit</li> <li>• 10 units</li> <li>• 50 units</li> </ul>	<b>6GK1901-1BB10-2AA0</b> <b>6GK1901-1BB10-2AB0</b> <b>6GK1901-1BB10-2AE0</b>
		<b>PROFIBUS/PROFINET bus components</b> For establishing MPI/PROFIBUS/PROFINET communication	See catalogs IK PI, CA 01

## Overview



- For constructing a fail-safe automation system for plants with increased safety requirements
- High-performance CPU in the top-end performance range
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- 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 *PROFIsafe* profile
- Fail-safe I/O modules can be connected decentralized over the integrated interfaces (DP and PN with CPU416F-3 PN/DP) and/or through communication modules (CP443-5 Ext. and CP443-1 Adv.)
- Standard modules for non-safety-related applications can be operated centrally and decentralized

## Technical specifications

Article number	6ES7416-2FP07-0AB0	6ES7416-3FS07-0AB0
	CPU 416F-2, MPI, PROFIBUS, 8 MB	CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>General information</b>		
Product type designation	CPU 416F-2	CPU416F-3 PN/DP
<b>Engineering with</b>		
• Programming package	STEP 7 V5.4 or higher with HSP 261	STEP 7 V5.5 or higher with HSP 262
<b>Supply voltage</b>		
Rated value (DC)		
• 24 V DC	No; Power supply via system power supply	No; Power supply via system power supply
<b>Power loss</b>		
Power loss, typ.	4.5 W	6.5 W
<b>Memory</b>		
<b>Work memory</b>		
• integrated	8 Mbyte	16 Mbyte
• integrated (for program)	4 Mbyte	8 Mbyte
• integrated (for data)	4 Mbyte	8 Mbyte
<b>Load memory</b>		
• expandable FEPRAM, max.	64 Mbyte	64 Mbyte
• integrated RAM, max.	1 Mbyte	1 Mbyte
• expandable RAM, max.	64 Mbyte	64 Mbyte
<b>CPU processing times</b>		
for bit operations, typ.	12.5 ns	12.5 ns
for word operations, typ.	12.5 ns	12.5 ns
for fixed point arithmetic, typ.	12.5 ns	12.5 ns
for floating point arithmetic, typ.	25 ns	25 ns
<b>Counters, timers and their retentivity</b>		
<b>S7 counter</b>		
• Number	2 048	2 048
<b>IEC counter</b>		
• present	Yes	Yes
<b>S7 times</b>		
• Number	2 048	2 048
<b>IEC timer</b>		
• present	Yes	Yes

Article number	6ES7416-2FP07-0AB0	6ES7416-3FS07-0AB0
	CPU 416F-2, MPI, PROFIBUS, 8 MB	CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>Data areas and their retentivity</b>		
<b>Flag</b>		
• Number, max.	16 kbyte; Size of bit memory address area	16 kbyte; Size of bit memory address area
<b>Address area</b>		
<b>I/O address area</b>		
• Inputs	16 kbyte	16 kbyte
• Outputs	16 kbyte	16 kbyte
<b>Process image</b>		
• Inputs, adjustable	16 kbyte	16 kbyte
• Outputs, adjustable	16 kbyte	16 kbyte
<b>Time of day</b>		
<b>Clock</b>		
• Hardware clock (real-time clock)	Yes	Yes
<b>Operating hours counter</b>		
• Number	16	16
<b>Interfaces</b>		
Interfaces/bus type	1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP	1 x MPI/PROFIBUS DP, 1 x PROFINET (2 ports), 1 x PROFIBUS DP (optionally pluggable)
Number of RS 485 interfaces	2; Combined MPI / PROFIBUS DP and PROFIBUS DP	1; Combined MPI / PROFIBUS DP
Number of other interfaces		1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)
<b>1. Interface</b>		
Interface type	Integrated	Integrated
Physics	RS 485 / PROFIBUS + MPI	RS 485 / PROFIBUS + MPI
<b>Functionality</b>		
• MPI	Yes	Yes
• DP master	Yes	Yes
• DP slave	Yes	Yes
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
<b>DP master</b>		
• Number of DP slaves, max.	32	32



**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 416F****Technical specifications (continued)**

Article number	<b>6ES7416-2FP07-0AB0</b>	<b>6ES7416-3FS07-0AB0</b>
	CPU 416F-2, MPI, PROFIBUS, 8 MB	CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>2. Interface</b>		
Interface type	Integrated	PROFINET
Physics	RS 485 / PROFIBUS	Ethernet RJ45
<b>Interface types</b>		
• Number of ports		2
<b>Functionality</b>		
• DP master	Yes	No
• DP slave	Yes	No
• PROFINET IO Controller		Yes
• PROFINET IO Device		Yes
• PROFINET CBA		Yes
• PROFIBUS DP master	Yes	No
• PROFIBUS DP slave	Yes	No
<b>DP master</b>		
• Number of DP slaves, max.	125	
<b>3. Interface</b>		
Interface type		Pluggable interface module (IF)
Plug-in interface modules		IF 964-DP (MLFB: 6ES7964-2AA04-0AB0)
Physics		RS 485 / PROFIBUS
<b>Functionality</b>		
• MPI		No
• DP master		Yes
• DP slave		Yes
• PROFIBUS DP master		Yes
• PROFIBUS DP slave		Yes
<b>DP master</b>		
• Number of DP slaves, max.		125
<b>Isochronous mode</b>		
Isochronous operation (application synchronized up to terminal)	Yes; For PROFIBUS only	Yes; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>		
PG/OP communication	Yes	Yes
Data record routing	Yes	Yes
<b>Global data communication</b>		
• supported	Yes	Yes
<b>S7 basic communication</b>		
• supported	Yes	Yes
<b>S7 communication</b>		
• supported	Yes	Yes
<b>S5 compatible communication</b>		
• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
<b>Standard communication (FMS)</b>		
• supported	Yes; Via CP and loadable FB	Yes; Via CP and loadable FB

Article number	<b>6ES7416-2FP07-0AB0</b>	<b>6ES7416-3FS07-0AB0</b>
	CPU 416F-2, MPI, PROFIBUS, 8 MB	CPU416F-3 PN/DP, 16 MB, 3 INTERFACES
<b>Open IE communication</b>		
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		94
• ISO-on-TCP (RFC1006)	Via CP 443-1 and loadable FB	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
- Number of connections, max.		94
• UDP		Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		94
<b>Web server</b>		
• supported	No	Yes
• Web server	No	Yes
<b>Number of connections</b>		
• overall	96	96
<b>Standards, approvals, certificates</b>		
<b>Use in hazardous areas</b>		
• ATEX	ATEX II 3 G Ex nA IIC T4 Gc	ATEX II 3 G Ex nA IIC T4 Gc
<b>Ambient conditions</b>		
<b>Ambient temperature during operation</b>		
• min.	0 °C	0 °C
• max.	60 °C	60 °C
<b>Configuration</b>		
<b>Know-how protection</b>		
• User program protection/ password protection	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy
<b>Dimensions</b>		
Width	25 mm	50 mm
Height	290 mm	290 mm
Depth	219 mm	219 mm
<b>Weights</b>		
Weight, approx.	700 g	900 g

Ordering data	Article No.	Ordering data	Article No.
<b>CPU 416F-2</b> For configuring safety-related automation systems; 8 MB work memory, 24 V DC power supply, MPI/PROFIBUS DP master interface, PROFIBUS DP master interface, slot for memory card, incl. slot number labels	6ES7416-2FP07-0AB0	<b>FEPROM memory card</b> <ul style="list-style-type: none"> <li>• 64 KB</li> <li>• 256 KB</li> <li>• 1 MB</li> <li>• 2 MB</li> <li>• 4 MB</li> <li>• 8 MB</li> <li>• 16 MB</li> <li>• 32 MB</li> <li>• 64 MB</li> </ul>	6ES7952-0KF00-0AA0 6ES7952-0KH00-0AA0 6ES7952-1KK00-0AA0 6ES7952-1KL00-0AA0 6ES7952-1KM00-0AA0 6ES7952-1KP00-0AA0 6ES7952-1KS00-0AA0 6ES7952-1KT00-0AA0 6ES7952-1KY00-0AA0
<b>CPU 416F-3 PN/DP</b> For configuring safety-related automation systems; work memory 16 MB, 24 V DC power supply, MPI/PROFIBUS DP master interface, PROFINET interface, PROFIBUS DP master interface, receptacle for 1 IF module, slot for memory card, incl. slot number labels	6ES7416-3FS07-0AB0	<b>MPI cable</b> For connection of SIMATIC S7 and PG via MPI; length: 5 m	6ES7901-0BF00-0AA0
<b>S7 Distributed Safety programming tool V5.4</b> Task: Engineering tool for configuring failsafe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 V5.3 SP3 or higher <ul style="list-style-type: none"> <li>• Floating License</li> <li>• Floating License for 1 user, license key download without software or documentation<sup>1)</sup>; e-mail address required for delivery</li> </ul>	6ES7833-1FC02-0YA5 6ES7833-1FC02-0YH5	<b>IF 964-DP interface module</b> For connecting an additional DP line	6ES7964-2AA04-0AB0
<b>S7 Distributed Safety upgrade</b> Von V5.x auf V5.4; Floating License for 1 user	6ES7833-1FC02-0YE5	<b>Slot number labels</b> 1 set (spare part)	6ES7912-0AA00-0AA0
<b>STEP 7 Safety Advanced V13</b> Task: Engineering tool for configuring failsafe user programs for SIMATIC S7-1500F, S7-300F, S7-400F, WinAC RTX F, ET200SP, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: STEP 7 Professional V13 <ul style="list-style-type: none"> <li>• Floating License for 1 user</li> <li>• Floating License for 1 user, license key download without software or documentation<sup>1)</sup>; e-mail address required for delivery</li> </ul>	6ES7833-1FA13-0YA5 6ES7833-1FA13-0YH5	<b>SIMATIC Manual Collection</b> Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	6ES7998-8XC01-8YE0
<b>RAM memory card</b> <ul style="list-style-type: none"> <li>• 64 KB</li> <li>• 256 KB</li> <li>• 1 MB</li> <li>• 2 MB</li> <li>• 4 MB</li> <li>• 8 MB</li> <li>• 16 MB</li> <li>• 64 MB</li> </ul>	6ES7952-0AF00-0AA0 6ES7952-1AH00-0AA0 6ES7952-1AK00-0AA0 6ES7952-1AL00-0AA0 6ES7952-1AM00-0AA0 6ES7952-1AP00-0AA0 6ES7952-1AS00-0AA0 6ES7952-1AY00-0AA0	<b>SIMATIC Manual Collection update service for 1 year</b> Current "Manual Collection" DVD and the three subsequent updates	6ES7998-8XC01-8YE2
		<b>PROFIBUS bus components</b>	
		<b>RS 485 bus connector with 90° cable outlet</b> Max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
		<b>RS 485 bus connector with angled cable outlet</b> Max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>• Without PG interface</li> <li>• With PG interface</li> </ul>	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0
		<b>RS 485 bus connector with 90° cable outlet for FastConnect system</b> Max. transfer rate 12 Mbps <ul style="list-style-type: none"> <li>• Without PG interface               <ul style="list-style-type: none"> <li>- 1 unit</li> <li>- 100 units</li> </ul> </li> <li>• With PG interface               <ul style="list-style-type: none"> <li>- 1 unit</li> <li>- 100 units</li> </ul> </li> </ul>	6ES7972-0BA52-0XA0 6ES7972-0BA52-0XB0 6ES7972-0BB52-0XA0 6ES7972-0BB52-0XB0
		<b>RS 485 bus connector with axial cable outlet</b> For SIMATIC OP, for connection to PPI, MPI, PROFIBUS	6GK1500-0EA02

<sup>1)</sup> For up-to-date information and download availability, see: <http://www.siemens.com/tia-online-software-delivery>

**SIMATIC S7-400 advanced controller**

Central processing units

Fail-safe CPUs

**CPU 416F****Ordering data****Article No.****Article No.****PROFIBUS FastConnect bus cable**

Standard type with special design for fast mounting, 2-core, shielded, sold by the meter; max. delivery unit 1 000 m, minimum ordering quantity 20 m

**6XV1830-0EH10****RS 485 repeater for PROFIBUS**

Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure

**6ES7972-0AA02-0XA0****PROFINET bus components****IE FC TP standard cable GP 2x2**

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

**6XV1840-2AH10****FO standard cable GP (50/125)**

Standard cable, splittable, UL approval, sold by the meter

**6XV1873-2A****SCALANCE X204-2 Industrial Ethernet Switch**

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 Mbps RJ45 ports and two FO ports

**6GK5204-2BB10-2AA3****IE FC RJ45 plugs**

RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables

**IE FC RJ45 Plug 180**

180° cable outlet

- 1 unit
- 10 units
- 50 units

**6GK1901-1BB10-2AA0**  
**6GK1901-1BB10-2AB0**  
**6GK1901-1BB10-2AE0**

**PROFIBUS/PROFINET bus components**

For establishing MPI/PROFIBUS/PROFINET communication

See catalogs IK PI, CA 01

**Overview**

- Transceiver for the transition from a redundant PROFIBUS DP master system to a single-channel PROFIBUS DP master system
- To connect devices with a single PROFIBUS DP interface to the redundant PROFIBUS DP master system of the SIMATIC S7-400H

**Technical specifications**

Article number	<b>6ES7153-2BA70-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>General information</b>	
Vendor identification (VendorID)	801Eh
<b>Supply voltage</b>	
Rated value (DC)	
• 24 V DC	Yes
permissible range (ripple included), lower limit (DC)	20.4 V
permissible range (ripple included), upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2,5 A
<b>Mains buffering</b>	
• Mains/voltage failure stored energy time	5 ms
<b>Input current</b>	
Current consumption, max.	650 mA
Inrush current, typ.	3 A
I <sup>2</sup> t	0.1 A <sup>2</sup> ·s
<b>Output current</b>	
for backplane bus (5 V DC), max.	1.5 A
<b>Power loss</b>	
Power loss, typ.	5.5 W
<b>Address area</b>	
<b>Addressing volume</b>	
• Inputs	244 byte
• Outputs	244 byte
<b>Hardware configuration</b>	
Number of modules per DP slave interface, max.	12
<b>Time stamping</b>	
Accuracy	1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules
Number of message buffers	15

Article number	<b>6ES7153-2BA70-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
Messages per message buffer	20
Number of stampable digital inputs, max.	128; Max. 128 signals/station; max. 32 signals/slot
Time format	RFC 1119
Time resolution	0.466 ns
Time interval for transmitting the message buffer if a message is present	1 000 ms
Time stamp on signal change	rising / falling edge as signal entering or exiting
<b>Interfaces</b>	
Interface physics, RS 485	Yes
Interface physics, FOC	No
<b>PROFIBUS DP</b>	
• Node addresses	1 to 125 permitted
• automatic detection of transmission rate	Yes
• Output current, max.	70 mA
• Transmission rate, max.	12 Mbit/s
• Transmission procedure	RS 485
• SYNC capability	Yes
• FREEZE capability	Yes
• Direct data exchange (slave-to-slave communication)	Yes; as publisher with all IO, as subscriber with F-IO only
• Connector type	9-pin sub D
<b>1. Interface</b>	
<b>DP slave</b>	
• GSD file	SI05801E.GSG
• automatic baud rate search	Yes
<b>Protocols</b>	
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170
<b>Isolation</b>	
Isolation tested with	Isolation voltage 500 V
<b>Degree and class of protection</b>	
Degree of protection acc. to EN 60529	
• IP20	Yes

## SIMATIC S7-400 advanced controller

Central processing units  
High-availability CPUs

### Y-link for S7-400H

#### Technical specifications (continued)

Article number	<b>6ES7153-2BA70-0XB0</b> ET200M, INTERFACE IM153-2 HF OUTDOOR
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operating altitude above sea level, max.	3 000 m
<b>Configuration</b>	
<b>Configuration software</b>	
• STEP 7	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	117 mm
<b>Weights</b>	
Weight, approx.	360 g
Article number	<b>6ES7197-1LB00-0XA0</b> Y-COUPLER F. BUILDING Y-LINK, REDUNDANT
<b>General information</b>	
<b>Requirements for DP master system</b>	
• Length of parameter assignment telegram	244 byte
<b>Supply voltage</b>	
Description	via bus module
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
<b>Interfaces</b>	
<b>PROFIBUS DP</b>	
<b>Properties of the lower-level DP master system</b>	
- Transmission rate, max.	12 Mbit/s; 45.45 kbit/s to 12 Mbit/s
- Termination of lower-level DP master system	Active terminating resistor (Bus Terminator)
- Use of OLM/OBT	Yes
- Use of RS 485 repeaters, max.	9
- Number of DP slaves, max.	31; 64 when using RS 485 repeaters or OLM/OBT
<b>Protocols</b>	
PROFIBUS DP	Yes
<b>Interrupts/diagnostics/status information</b>	
Status indicator	No
Alarms	No
Diagnostic functions	Yes
<b>Potential separation</b>	
to lower-level DP master system	Yes
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	200 g

#### Ordering data

#### Article No.

For use with STEP 7 from V5.4 or SIMATIC PCS 7 from V7.0

#### Y link

For connecting devices with only one PROFIBUS DP interface to a redundant S7-400H, comprising:

- 2 IM 153-2 High Feature Outdoor interface modules (6ES7153-2BA70-0XA0)
- 1 Y coupler (6ES7197-1LB00-0XA0)
- 1 BM IM/IM bus module (6ES7195-7HD80-0XA0)
- 1 BM Y-coupler bus module (6ES7654-7HY00-0XA0)

**6ES7197-1LA12-0XA0**

#### Accessories

#### Mounting rail

For assembling the Y link with active bus modules

- Length 483 mm
- Length 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**

**Overview**

- Bus coupler for transition from a redundant PROFIBUS DP master system to a single-channel PROFIBUS DP master system
- For connection of devices with only one PROFIBUS DP interface to the redundant PROFIBUS DP master system of the SIMATIC S7-400H

**Note:**

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical documentation on SIPLUS can be found here:  
<http://www.siemens.com/siplus-extreme>

**Technical specifications**

Article number	<b>6AG1153-2BA10-7XB0</b>
Based on	<b>6ES7153-2BA10-0XB0</b> SIPLUS ET200M IM153-2 HF
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	-25 °C
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Article number	<b>6AG1197-1LB00-4XA0</b>
Based on	<b>6ES7197-1LB00-0XA0</b> SIPLUS S7 Y COUPLER
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C; = Tmin
• max.	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**SIMATIC S7-400 advanced controller**

Central processing units

SIPLUS high-availability CPUs

**SIPLUS Y-Link for S7-400H****Technical specifications (continued)**

Article number	<b>6AG1195-7HD10-2XA0</b>
Based on	<b>6ES7195-7HD10-0XA0</b> SIPLUS ET200M DP BUS MODULE
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Extended ambient conditions</b>	
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
<b>Relative humidity</b>	
- With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Resistance</b>	
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

**Ordering data****Article No.****SIPLUS ET 200M IM 153-2 High Feature (2 units required)**

Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 12 S7-300 modules; also for use in redundant systems

- Extended temperature range and exposure to media

**6AG1153-2BA10-7XB0****Y coupler**

For establishing a Y-link for redundant controllers

- Exposure to media

**6AG1197-1LB00-4XA0****Bus module for SIPLUS ET 200M**

Bus module for accommodating two IM-153 modules for the hot-swapping function; for setting up redundant systems

- Extended temperature range and exposure to media

**6AG1195-7HD10-2XA0****SIPLUS S7 bus module BM Y-coupler**

to accommodate a Y-coupler incl. bus module cover

- Extended temperature range and exposure to media

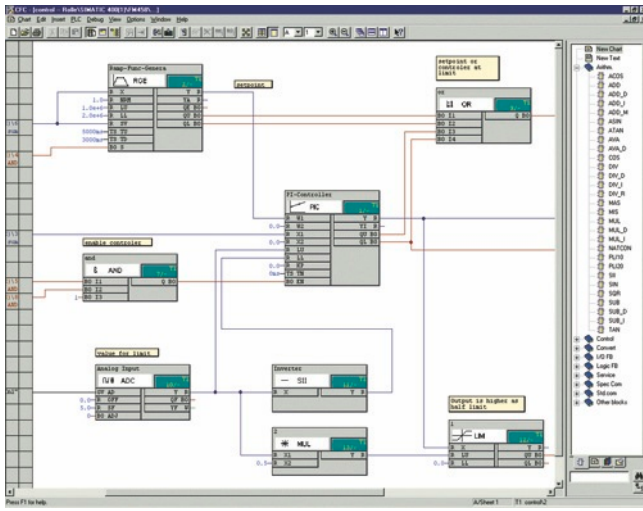
**6AG1654-7HY00-7XA0****Accessories***Consumables***Mounting rail**

For assembling the Y-link with active bus modules

- Length 483 mm
- Length 530 mm

**6ES7195-1GA00-0XA0**  
**6ES7195-1GF30-0XA0**

## Overview



- Optional package for STEP 7 V5.5 for configuring closed-loop control and automation tasks with SIMATIC TDC, FM 458-1 DP and T400
- Extensive block library
- Generation of user libraries in ANSI C with D7-FB-GEN function block generator

## Ordering data

## Article No.

**SIMATIC D7-SYS V8.1**

Reference hardware:  
SIMATIC TDC, FM 458-1 DP, T400

Requirement:

MS Windows 7 Professional/  
Enterprise/Ultimate + SP1  
(32/64-bit);

MS Windows XP Professional SP3  
(32-bit);

MS Windows Server 2003 R2 SP2  
(32-bit) / 2008 R2 SP1 (64-bit);

STEP 7 V5.5 SP4 or higher

Type of delivery:

on DVD, German, English,

with electronic documentation

Floating license

**6ES7852-0CC04-0YA5**

Upgrade License V7.x and higher

**6ES7852-0CC04-0YE5**

Software Update Service<sup>1)</sup>

**6ES7852-0CC01-0YL5**

**SIMATIC Manual Collection**

**6ES7998-8XC01-8YE0**

Electronic manuals on DVD,  
multilingual: LOGO!, SIMADYN,  
SIMATIC bus components,  
SIMATIC C7,  
SIMATIC distributed I/O,  
SIMATIC HMI, SIMATIC Sensors,  
SIMATIC NET, SIMATIC PC Based  
Automation, SIMATIC PCS 7,  
SIMATIC PG/PC, SIMATIC S7,  
SIMATIC Software, SIMATIC TDC

**SIMATIC Manual Collection  
update service for 1 year**

**6ES7998-8XC01-8YE2**

Current "Manual Collection" DVD  
and the three subsequent updates

<sup>1)</sup> For more information on the software update service, see chapter 11,  
page 11/2.



## SIMATIC S7-400 advanced controller

### Notes

6