

## SIMATIC S7-200



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**Brochures**

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

# SIMATIC S7-200

## Introduction

### S7-200

#### Overview

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

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

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

- The PLC for use under extremely harsh environmental conditions
- With enhanced temperature range from -25 °C to +70 °C
- Use in environments with pollutant gases (corrosive gas atmospheres)
- Occasional short-term condensation and enhanced mechanical stress permissible
- With the proven PLC technology of the S7-200
- Easy handling, programming, maintenance and service
- Ideal for use in automobile construction, environmental technology, mining, chemical plants, conveying technology, food & beverages industry etc.
- The substitute for expensive special solutions

For more information, go to:

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### Technical specifications

General technical specifications SIMATIC S7-200	
Degree of protection	IP20 in accordance with IEC 529
Ambient temperature	
<ul style="list-style-type: none"> <li>• Operation (95 % relative humidity)               <ul style="list-style-type: none"> <li>- With horizontal mounting</li> <li>- With vertical mounting</li> </ul> </li> <li>• Transport and storage               <ul style="list-style-type: none"> <li>- with 95 % relative humidity</li> </ul> </li> </ul>	0 ... 55°C 0 ... 45°C -40 ... +70 °C 25 ... 55 °C
Isolation	
<ul style="list-style-type: none"> <li>• 5/24 V DC circuits</li> <li>• 115/230 V AC circuits to ground</li> <li>• 115/230 V AC circuits to 115/230 V AC circuits</li> <li>• 230 V AC circuits to 5/24 V DC circuits</li> <li>• 115 V AC circuits to 5/24 V DC circuits</li> </ul>	Test voltage 500 V AC Test voltage 1500 V AC Test voltage 1500 V AC Test voltage 1500 V AC Test voltage 1500 V AC
Electromagnetic compatibility	Requirements of EMC law
<ul style="list-style-type: none"> <li>• Noise immunity to EN 50082-2</li> <li>• Emitted interference according to EN 50081-1 and EN 50081-2</li> </ul>	Tested according to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160  Tested according to EN 55011, Class A, Group 1 and EN 55011, Class B, Group 1
Mechanical rating	
<ul style="list-style-type: none"> <li>• Vibrations, tested according to/tested with</li> <li>• Shock, tested according to/tested with</li> </ul>	IEC 68, Part 2-6: 10 to 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in control cabinet); type of vibration: frequency cycles with a rate of change of 1 octave/minute; vibration duration: 10 frequency cycles per axis in each direction of the 3 mutually perpendicular axes  IEC 68, Part 2-27/half-sine: shock strength 15 g (peak value), duration 11 ms, 6 shocks on each of the 3 mutually perpendicular axes

General technical specifications SIPLUS S7-200	
<b>Climatic environmental conditions</b>	
Temperature	Horizontal installation: -25 °C to 70 °C vertical installation: -25 °C to 50 °C
Relative humidity	5 to 95%; short-term condensation permissible, corresponds to relative humidity (RH) load 2 according to IEC 1131-2 and IEC 721 3-3 Cl. 3K5
Short-term ice formation	-25 °C to 0 °C IEC 721 3-3 Cl. 3K5
Air pressure	1080 to 795 hPa corresponds to an altitude of -1000 to 2000 m
Contaminant concentration	SO <sub>2</sub> : < 0.5 ppm; relative humidity < 60% test: 10 ppm, 4 days H <sub>2</sub> S: < 0.1 ppm; relative humidity < 60% test: 1 ppm, 4 days (to IEC 721 3-3; Class 3C3)
<b>Mechanical environmental conditions</b>	
Vibrations	Type of vibration: Frequency sweeps with a rate of change of 1 octave/minute. 2 Hz ≤ ≤ 9 Hz, constant amplitude 3.0 mm, 9 Hz ≤ ≤ 150 Hz, constant acceleration 1 g, duration of oscillation: 10 frequency cycles per axis in each of the three mutually perpendicular axes Vibration tests according to IEC 68 Part 2-6 (sine wave) and IEC 721 3-3, Class 3M4
Shock	Type of shock: Half-sine, intensity of shock: 15 g peak value, 11 ms duration, direction: 3 shocks each in +/- direction in each of the 3 perpendicular axes Shock testing in accordance with IEC 68 Part 2-27
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes <sup>1)</sup>

<sup>1)</sup> Does not apply to:  
 6AG1 214-2AD23-2XB0, 6AG1 214-2BD23-2XB0,  
 6AG1 232-0HB22-2XB0, 6AG1 235-0KD22-2XB0,  
 6AG1 231-7PB22-2XA0, 6AG1 901-3CB30-2XA0

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Overview CPU 221



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

### Overview CPU 224



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

### Overview CPU 222



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

### Overview CPU 224 XP / CPU 224 XPsi



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

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Overview CPU 226



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

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### Technical specifications

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
<b>Supply voltages</b>				
Rated value				
• DC 24 V	Yes		Yes	
• permissible range, lower limit (DC)	20.4 V		20.4 V	
• permissible range, upper limit (DC)	28.8 V		28.8 V	
• AC 120 V		Yes		Yes
• AC 230 V		Yes		Yes
• permissible range, lower limit (AC)		85 V		85 V
• permissible range, upper limit (AC)		264 V		264 V
• permissible frequency range, lower limit		47 Hz		47 Hz
• permissible frequency range, upper limit		63 Hz		63 Hz
<b>Load voltage L+</b>				
• Rated value (DC)	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	5 V	20.4 V	5 V
• permissible range, upper limit (DC)	28,8 V	30 V	28.8 V	30 V
<b>Load voltage L1</b>				
• Rated value (AC)		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC
• permissible range, lower limit (AC)		5 V		5 V
• permissible range, upper limit (AC)		250 V		250 V
• permissible frequency range, lower limit		47 Hz		47 Hz
• permissible frequency range, upper limit		63 Hz		63 Hz

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Technical specifications (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
<b>Current consumption</b>				
Inrush current, max.	10 A; at 28.8 V	20 A; at 264 V	10 A; at 28.8 V	20 A; at 264 V
from supply voltage L+, max.	450 mA; 80 to 450 mA		500 mA; 85 to 500 mA, output current for expansion modules (DC 5 V) 340 mA	
from supply voltage L1, max.		120 mA; 15 to 60 mA (240 V); 30 to 120 mA (120 V); output current for expansion modules (5 V DC) 340 mA		140 mA; 20 to 70 mA (240 V); 40 to 140 mA (120 V); output current for expansion modules (5 V DC) 340 mA
<b>Backup battery</b>				
• Backup time, max.	50 Hours; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module	50 Hours; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module	50 Hours; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module	50 Hours; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module
<b>Memory</b>				
Type of storage				
Number of memory modules (optional)	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files
Data and program memory				
• Data memory, max.	2 Kibyte	2 Kibyte	2 Kibyte	2 Kibyte
• Program memory, max.	4 Kibyte	4 Kibyte	4 Kibyte	4 Kibyte
<b>Backup</b>				
• present	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance- free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high- performance capacitor; optional battery for long- term buffering	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance- free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high- performance capacitor; optional battery for long- term buffering	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance- free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high- performance capacitor; optional battery for long- term buffering	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance- free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high- performance capacitor; optional battery for long- term buffering
<b>CPU/processing times</b>				
for bit operations, max.	0.22 µs	0.22 µs	0.22 µs	0.22 µs
<b>Times/counters and their remanence</b>				
S7 counter				
• Number	256	256	256	256
• of which remanent with battery				
- adjustable	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery
- lower limit	1	1	1	1
- upper limit	256	256	256	256
• Counting range				
- lower limit	0	0	0	0
- upper limit	32 767	32 767	32 767	32 767

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

### Technical specifications (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
S7 times				
• Number	256	256	256	256
• of which remanent with battery				
- adjustable	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery
- upper limit	64	64	64	64
• Time range				
- lower limit	1 ms	1 ms	1 ms	1 ms
- upper limit	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min
<b>Data areas and their remanence</b>				
Flag				
• Number, max.	32 byte	32 byte	32 byte	32 byte
• Remanence available	Yes; M 0.0 to M 31.7	Yes; M 0.0 to M 31.7	Yes; M 0.0 to M 31.7	Yes; M 0.0 to M 31.7
• of which remanent with battery	0 to 255, via high-performance capacitor or battery, adjustable	0 to 255, via high-performance capacitor or battery, adjustable	0 to 255, via high-performance capacitor or battery, adjustable	0 to 255, via high-performance capacitor or battery, adjustable
• of which remanent without battery	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable
<b>Hardware config.</b>				
Connectable programming devices/PCs	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC
Expansion devices, max.			2; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.	2; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.
Extension of distributed I/O				
• Analog inputs/outputs, max.			10; max. 8 inputs and 2 outputs (EM) or max. 0 inputs and 4 outputs (EM)	10; max. 8 inputs and 2 outputs (EM) or max. 0 inputs and 4 outputs (EM)
• Digital inputs/outputs, max.			78; max. 40 inputs and 38 outputs (CPU + EM)	78; max. 40 inputs and 38 outputs (CPU + EM)
• AS interface inputs/outputs max.			62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)
<b>Connection point</b>				
pluggable I/O terminals	No	No	No	No
<b>1st interface</b>				
Type of interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
Functionality				
• MPI	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communication is possible in the MPI network with restrictions; transmission rates: 19.2/187.5 Kbit/s			
• PPI	Yes; with PPI protocol for program functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communication ; transmission rates 9.6/19.2/187.5 kbit/s			
• serial data exchange	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 Kbit/s; the PC/PPI cable can also be used as RS232/RS485 converter			



# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Technical specifications (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
MPI				
• Transmission speeds, max.	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s
• Transmission speeds, min.	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s
<b>CPU/programming</b>				
Programming language				
• LAD	Yes	Yes	Yes	Yes
• FUP	Yes	Yes	Yes	Yes
• AWL	Yes	Yes	Yes	Yes
Operational stocks	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions
User program protection/password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection
Program processing	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer
Program organization	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer
Number of subroutines, max.	64	64	64	64
<b>Digital inputs</b>				
Number of digital inputs	6; integrated	6; integrated	8	8
m/p-reading	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group
Input voltage				
• Rated value, DC	24 V	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	0 to 5 V	0 to 5 V
• for signal "1"	min. 15 V	min. 15 V	min. 15 V	min. 15 V
Input current				
• for signal "1", typ.	2.5 mA	2.5 mA	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)				
• for standard inputs				
- programmable	Yes; all	Yes; all	Yes; all	Yes; all
- at "1" to "0", min.	0.2 ms	0.2 ms	0.2 ms	0.2 ms
- at "0" to "1", max.	12.8 ms	12.8 ms	12.8 ms	12.8 ms
• for interrupt inputs				
- programmable	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3
• for counter/technological functions				
- programmable	Yes; (E0.0 to E0.5) 30 kHz	Yes; (E0.0 to E0.5) 30 kHz	Yes; (E0.0 to E0.5) 30 kHz	Yes; (E0.0 to E0.5) 30 kHz
Cable length				
• cable length, shielded, max.	500 m; Standard input: 500 m, high-speed counters: 50 m	500 m; Standard input: 500 m, high-speed counters: 50 m	500 m; Standard input: 500 m, high-speed counters: 50 m	500 m; Standard input: 500 m, high-speed counters: 50 m
• cable length unshielded, max.	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals	300 m; not for high-speed signals



# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

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### Technical specifications (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
<b>Digital outputs</b>				
Number of digital outputs	4; Transistor	4; Relay	6; Transistor	4; Relay
Short-circuit protection of the output	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	1 W		1 W	
Switching capacity of the outputs				
• with resistive load, max.	0.75 A	2 A	0,75 A	2 A
• on lamp load, max.	5 W	30 W DC; 200 W AC	5 W	30 W DC; 200 W AC
Output voltage				
• for signal "1", min.	20 V DC	L+ / L1	DC 20 V	L+ / L1
Output current				
• for signal "1" rated value	750 mA	2 A	750 mA	2 A
• for signal "0" residual current, max.	0.1 mA	0 mA	10 µA	0 mA
Output delay with resistive load				
• "0" to "1", max.	15 µs; of the standard outputs, max. (Q0.2 to Q0.3) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 2 µs	10 ms; all outputs	15 µs; of the standard outputs, max. (Q0.2 to Q0.5) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 2 µs	10 ms; all outputs
• "1" to "0", max.	130 µs; of the standard outputs, max. (Q0.2 to Q0.3) 100 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 10 µs	10 ms; all outputs	130 µs; of the standard outputs, max. (Q0.2 to Q0.5) 100 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 10 µs	10 ms; all outputs
Parallel switching of 2 outputs				
• for increased power	Yes	No	Yes	No
Switching frequency				
• of the pulse outputs, with resistive load, max.	20 kHz; Q 0.0 to Q 0.1		20 kHz; Q 0.0 to Q 0.1	
Aggregate current of the outputs (per group)				
• horizontal installation - up to 55 °C, max.	3 A	6 A	4.5 A	6 A
• up to 40 °C, max.	3 A	6 A	4.5 A	6 A
• cable length, shielded, max.	500 m	500 m	500 m	500 m
• Cable length unshielded, max.	150 m	150 m	150 m	150 m
<b>Relay outputs</b>				
Number of operating cycles		1E7; mechanically 10 million, at rated load voltage 100,000		1E7; mechanically 10 million, at rated load voltage 100,000
<b>Analog inputs</b>				
Number of analog potentiometers	1; Analog potentiometer; resolution 8 bit	1; Analog potentiometer; resolution 8 bit	1; Analog potentiometer; resolution 8 bit	1; Analog potentiometer; resolution 8 bit
<b>Encoder supply</b>				
24 V encoder supply				
• 24 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 20.4 bis 28.8 V
• Short-circuit protection	Yes; electronic at 600 mA	Yes; electronic at 600 mA	Yes; electronic at 600 mA	Yes; electronic at 600 mA
• Output current, max.	180 mA	180 mA	180 mA	180 mA

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Technical specifications (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
<b>Encoder</b>				
Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA	1 mA
<b>Integrated Functions</b>				
Number of counters	4; High-speed counters (30 kHz each), 32 bits (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.			
Counter frequency (counter) max.	30 kHz	30 kHz	30 kHz	30 kHz
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges			
Number of pulse outputs	2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option	
Limit frequency (pulse)	20 kHz		20 kHz	
<b>Isolation</b>				
Galvanic isolation, digital inputs				
• between the channels	Yes	Yes	Yes	Yes
• between the channels, in groups of	2 and 4	2 and 4	4	4
Isolation, digital outputs				
• between the channels	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Relay
• between the channels, in groups of	4	1 and 3	6	3
<b>Permissible potential difference</b>				
between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC
<b>Environmental requirements</b>				
Environmental conditions	For further environmental conditions, see "Automation System S7-200, System Manual"			
Operating temperature				
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	45 °C	45 °C	45 °C	45 °C
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	55 °C	55 °C	55 °C	55 °C
Air pressure				
• permissible range, min.	860 hPa	860 hPa	860 hPa	860 hPa
• permissible range, max.	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa
Relative humidity				
• Operation, min.	5%			
• Operation, max.	95%; RH class 2 in accordance with IEC 1131-2			
<b>Degree of protection</b>				
IP20	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Dimensions				
• Width	90 mm	90 mm	90 mm	90 mm
• Height	80 mm	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm	62 mm
Weights				
• Weight, approx.	270 g	310 g	270 g	310 g

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
<b>Supply voltages</b>							
Rated value							
• DC 24 V	Yes		Yes		Yes	Yes	
• permissible range, lower limit (DC)	20.4 V		20.4 V		20.4 V	20.4 V	
• permissible range, upper limit (DC)	28.8 V		28.8 V		28.8 V	28.8 V	
• AC 120 V		Yes		Yes			Yes
• AC 230 V		Yes		Yes			Yes
• permissible range, lower limit (AC)		85 V		85 V			85 V
• permissible range, upper limit (AC)		264 V		264 V			264 V
• permissible frequency range, lower limit		47 Hz		47 Hz			47 Hz
• permissible frequency range, upper limit		63 Hz		63 Hz			63 Hz
<b>Load voltage L+</b>							
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	5 V	20.4 V	5 V	20.4 V	20.4 V	5 V
• permissible range, upper limit (DC)	28.8 V	30 V	28.8 V	30 V	28.8 V	28.8 V	30 V
<b>Load voltage L1</b>							
• Rated value (AC)		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC			100 V; 100 to 230 V AC
• permissible range, lower limit (AC)		5 V		5 V			5 V
• permissible range, upper limit (AC)		250 V		250 V			250 V
• permissible frequency range, lower limit		47 Hz		47 Hz			47 Hz
• permissible frequency range, upper limit		63 Hz		63 Hz			63 Hz
<b>Current consumption</b>							
Inrush current, max.	12 A; at 28.8 V	20 A; at 264 V	12 A; at 28.8 V	20 A; at 264 V	12 A; at 28.8 V	10 A; at 28.8 V	20 A; at 264 V
from supply voltage L+, max.	700 mA; 110 to 700 mA, output current for expansion modules (DC 5 V) 660 mA		900 mA; 120 to 900 mA, output current for expansion modules (DC 5 V) 660 mA		900 mA; 120 to 900 mA, output current for expansion modules (DC 5 V) 660 mA	1 050 mA; 150 to 1050 mA output current for expansion modules (DC 5 V) 1000 mA	
from supply voltage L1, max.		200 mA; 30 to 100 mA (240 V); 60 to 200 mA (120 V); output current for expansion modules (5 V DC) 600 mA		220 mA; 35 to 100 mA (240 V); 70 to 220 mA (120 V); output current for expansion modules (5 V DC) 600 mA			320 mA; 40 to 160 mA (240 V); 80 to 320 mA (120 V); output current for expansion modules (5 V DC) 1000 mA

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
<b>Backup battery</b>							
• Backup time, max.	100 Hours; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module						
<b>Memory</b>							
Type of storage							
Number of memory modules (optional)	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files						
Data and program memory							
• Data memory, max.	8 Kibyte	8 Kibyte	10 Kibyte	10 Kibyte	10 Kibyte	10 Kibyte	10 Kibyte
• Program memory, max.	12 Kibyte; 8 KB on active run-time edit	12 Kibyte; 8 KB on active run-time edit	16 Kibyte; 12 KB for active run-time edit	16 Kibyte; 12 KB for active run-time edit	16 Kibyte; 12 KB for active run-time edit	24 Kibyte; 16 KB with active run-time edit	24 Kibyte; 16 KB with active run-time edit
<b>Backup</b>							
• present	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering						
<b>CPU/processing times</b>							
for bit operations, max.	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs
<b>Times/counters and their remanence</b>							
S7 counter							
• Number	256	256	256	256	256	256	256
• of which remanent with battery	Yes; via high-performance capacitor or battery						
- adjustable	1						
- lower limit	256						
- upper limit							
• Counting range							
- lower limit	0	0	0	0	0	0	0
- upper limit	32 767	32 767	32 767	32 767	32 767	32 767	32 767
S7 times							
• Number	256	256	256	256	256	256	256
• of which remanent with battery	Yes; via high-performance capacitor or battery						
- adjustable	64						
- upper limit							
• Time range	1 ms						
- lower limit	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min						
- upper limit							
<b>Data areas and their remanence</b>							
Flag							
• Number, max.	32 byte						
• Remanence available	Yes; M 0.0 to M 31.7						
• of which remanent with battery	0 to 255, via high-performance capacitor or battery, adjustable						
• of which remanent without battery	0 to 112 in EEPROM, adjustable						
<b>Hardware config.</b>							
Connectable programming devices/PCs	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC	SIMATIC PG/PC, standard PC
Expansion devices, max.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.						

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Extension of distributed I/O							
• Analog inputs/outputs, max.	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; 2 onboard inputs and 1 output, also max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)
• Digital inputs/outputs, max.	168; max. 94 inputs and 74 outputs (CPU + EM)	168; max. 94 inputs and 74 outputs (CPU + EM)	168; max. 94 inputs and 74 outputs (CPU + EM)	168; max. 94 inputs and 74 outputs (CPU + EM)	168; max. 94 inputs and 74 outputs (CPU + EM)	148; max. 128 inputs and 120 outputs (CPU+EM)	148; max. 128 inputs and 120 outputs (CPU+EM)
• AS interface inputs/outputs max.	62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)	62; AS-Interface A/B slaves (CP 243-2)
<b>Connection point</b>							
pluggable I/O terminals	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>1st interface</b>							
Type of interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485	RS 485	RS 485	RS 485
Functionality							
• MPI	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400 CPUs, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communication is possible in the MPI network with restrictions; transmission rates: 19.2/187.5 Kbit/s						
• PPI	Yes; with PPI protocol for program functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communication ; transmission rates 9.6/19.2/187.5 kbit/s						
• serial data exchange	Yes; as freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 Kbit/s; the PC/PPI cable can also be used as RS232/RS485 converter						
MPI							
• Transmission speeds, max.	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s
• Transmission speeds, min.	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s
<b>2nd interface</b>							
Type of interface			Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface	Integral RS 485 interface
Physics			RS 485	RS 485	RS 485	RS 485	RS 485
Functionality							
• MPI	Yes; as MPI slave for data exchange with MPI masters (S7-300/S7-400-CPU, OPs, TDs, Push Button Panels); S7-200-internal CPU/CPU communication is possible in the MPI network with restrictions; transmission rates: 19.2/187.5 kbit/s						
• PPI	Yes; with PPI protocol for program functions, HMI functions (TD 200, OP), S7-200-internal CPU/CPU communication ; transmission rates 9.6/19.2/187.5 kbit/s						
• serial data exchange	Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2 kbit/s; the PC/PPI cable can be used as an RS232/RS485 converter						

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
MPI							
• Transmission speed, max.			187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s
• Transmission speed, min.			19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s
<b>CPU/programming</b>							
Programming language							
• LAD	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• FUP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• AWL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operational stocks	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions						
User program protection/password protection	Yes; 3-stage password protection						
Program processing	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)						
Program organization	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer						
Number of subroutines, max.	64	64	64	64	64	64	64
<b>Digital inputs</b>							
Number of digital inputs	14	14	14	14	14	24	24
m/p-reading	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group
Input voltage							
• Rated value, DC	24 V	24 V	24 V	24 V	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)	0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)	0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)	0 to 5 V	0 to 5 V
• for signal "1"	min. 15 V	min. 15 V	min. 15 V; min. 4 V (I 0.3 to I 0.5)	min. 15 V; min. 4 V (I 0.3 to I 0.5)	min. 15 V; min. 4 V (I 0.3 to I 0.5)	min. 15 V	min. 15 V
Input current							
• for signal "1", typ.	2.5 mA	2.5 mA	2.5 mA; 8 mA for I 0.3 to I 0.5	2.5 mA; 8 mA for I 0.3 to I 0.5	2.5 mA; 8 mA for I 0.3 to I 0.5	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)							
• for standard inputs							
- programmable	Yes; all	Yes; all	Yes; all	Yes; all	Yes; all	Yes; all	Yes; all
- at "1", min.	0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms
- at "0" to "1", max.	12.8 ms	12.8 ms	12.8 ms	12.8 ms	12.8 ms	12.8 ms	12.8 ms
• for interrupt inputs							
- programmable	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3	Yes; I 0.0 to I 0.3
• for counter/technological functions							
- programmable	Yes; (E0.0 to E1.5) 30 kHz	Yes; (E0.0 to E1.5) 30 kHz	Yes; (E0.0 to E1.5) up to 200 kHz	Yes; (E0.0 to E1.5) up to 200 kHz	Yes; (E0.0 to E1.5) up to 200 kHz	Yes; (E0.0 to E1.5) 30 kHz	Yes; (E0.0 to E1.5) 30 kHz
Cable length							
• cable length, shielded, max.	500 m; Standard input: 500 m, high-speed counters: 50 m						
• cable length unshielded, max.	300 m; not for high-speed signals						

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
<b>Digital outputs</b>							
Number of digital outputs	10; Transistor	10; Relay	10; Transistor	10; Relay	10; Transistor current sinking	16; Transistor	16; Relay
Short-circuit protection of the output	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	1 W		1 W		1 W	1 W	
Switching capacity of the outputs							
• with resistive load, max.	0.75 A	2 A	0.75 A	2 A	0.75 A	0.75 A	2 A
• on lamp load, max.	5 W	200 W; 30 W DC; 200 W AC	5 W	200 W; 30 W DC; 200 W AC	5 W	5 W	200 W; 30 W DC; 200 W AC
Output voltage							
• for signal "1", min.	20 V DC	L+/L1	L+ (-0.4 V (5 V / 20.4 V for A 0.0 to A 0.4; 20.4 V A 0.5 to A1.1))	L+/L1	1M -0.4 V	20 VDC	L+/L1
Output current							
• for signal "1" rated value	750 mA	2 A	750 mA	2 A	750 mA	750 mA	2 A
• for signal "0" residual current, max.	10 µA	0 mA	10 µA	0 mA	10 µA	10 µA	0 mA
Output delay with resistive load							
• "0" to "1", max.	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 2 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 2 µs	10 ms; all outputs	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 0.5 µs	10 ms; all outputs	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 0.5 µs	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 2 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 2 µs	10 ms; all outputs
• "1" to "0", max.	130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 10 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 10 µs	10 ms; all outputs	130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 130 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 1.5 µs	10 ms; all outputs	130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 130 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 1.5 µs	130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 10 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 10 µs	10 ms; all outputs
Parallel switching of 2 outputs							
• for increased power	Yes	No	Yes	No	Yes	Yes	No
Switching frequency							
• of the pulse outputs, with resistive load, max.	20 kHz; Q 0.0 to Q 0.1	1 Hz	100 kHz; Q 0.0 to Q 0.1	1 Hz	100 kHz; Q 0.0 to Q 0.1	20 kHz; Q 0.0 to Q 0.1	1 kHz
Aggregate current of the outputs (per group)							
• horizontal installation - up to 55 °C, max.	6 A	10 A	3,75 A	10 A	3,75 A	6 A	10 A
• up to 40 °C, max.	6 A	10 A	3,75 A	10 A	3,75 A	6 A	10 A
• cable length, shielded, max.	500 m	500 m	500 m	500 m	500 m	500 m	500 m
• cable length unshielded, max.	150 m	150 m	150 m	150 m	150 m	150 m	150 m



# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
<b>Relay outputs</b>							
Number of operating cycles		1E7; mechanically 10 million, at rated load voltage 100,000		1E7; mechanically 10 million, at rated load voltage 100,000			1E7; mechanically 10 million, at rated load voltage 100,000
<b>Analog inputs</b>							
Number of analog potentiometers	2; Analog potentiometer; resolution 8 bit	2; Analog potentiometer; resolution 8 bit	2; Analog potentiometer; resolution 8 bit	2; Analog potentiometer; resolution 8 bit	2; Analog potentiometer; resolution 8 bit	2; Analog potentiometer; resolution 8 bit	2; Analog potentiometer; resolution 8 bit
<b>Encoder supply</b>							
24 V encoder supply							
• 24 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 20.4 bis 28.8 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 20.4 bis 28.8 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 20.4 bis 28.8 V
• Short-circuit protection	Yes; electronic at 280 mA	Yes; electronic at 280 mA	Yes; electronic at 280 mA	Yes; electronic at 280 mA	Yes; electronic at 280 mA	Yes; electronic at 400 mA	Yes; electronic at 400 mA
• Output current, max.	280 mA	280 mA	280 mA	280 mA	280 mA	400 mA	400 mA
<b>Encoder</b>							
Connectable encoders							
• 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA	Yes 1 mA
<b>Integrated Functions</b>							
Number of counters	6; High-speed counters (30 kHz each), 32 bits (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (30 kHz each), 32 bits (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bits (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bits (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bits (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (30 kHz each), 32 bits (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.	6; High-speed counters (30 kHz each), 32 bits (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.
Counter frequency (counter) max.	30 kHz	30 kHz	200 kHz	200 kHz	200 kHz	30 kHz	30 kHz

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

3

### Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 214-2AS23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges						
Number of pulse outputs	2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option		2; high-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option
Limit frequency (pulse)	20 kHz		20 kHz		20 kHz		20 kHz
<b>Isolation</b>							
Galvanic isolation, digital inputs							
• between the channels	Yes	Yes	Yes	Yes	Yes	Yes	Yes; Optocoupler
• between the channels, in groups of	6 and 8	6 and 8	6 and 8	6 and 8	6 and 8	13 and 11	13 and 11
Isolation, digital outputs							
• between the channels	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Optocoupler	Yes; Relay
• between the channels, in groups of	5	3 and 4	5	3 and 4	10	8 and 8	4, 5 and 7
<b>Permissible potential difference</b>							
between different circuits	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC	500 V DC between 24 V DC and 5 V DC
<b>Environmental requirements</b>							
Environmental conditions	For further environmental conditions, see "Automation System S7-200, System Manual"						
Operating temperature							
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	55 °C	55 °C	55 °C	55 °C	55 °C	55 °C	55 °C
Air pressure							
• permissible range, min.	860 hPa	860 hPa	860 hPa	860 hPa	860 hPa	860 hPa	860 hPa
• permissible range, max.	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa	1 080 hPa
Relative humidity							
• Operation, min.	5%						
• Operation, max.	95%; RH class 2 in accordance with IEC 1131-2						
<b>Degree of protection</b>							
IP 20	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>							
Dimensions							
• Width	120,5 mm	120,5 mm	140 mm	140 mm	140 mm	196 mm	196 mm
• Height	80 mm	80 mm	80 mm	80 mm	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm	62 mm	62 mm	62 mm	62 mm
Weights							
• Weight, approx.	360 g	410 g	390 g	440 g	390 g	550 g	660 g

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPsi, CPU 226

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Ordering Data	Order No.	Order No.
<b>CPU 221</b> Compact CPU, main memory 4 KB, power supply 24 V DC, 6 DI/4 DO integrated  Compact CPU, main memory 4 KB, power supply 100 V to 230 V AC, 6 DI/4 DO integrated, relay outputs	<b>6ES7 211-0AA23-0XB0</b>  <b>6ES7 211-0BA23-0XB0</b>	<b>S7-200 True Power Box</b> Complete package, comprising CPU 222, STEP 7 Micro/WIN V4, simulator, intelligent USB/PPI multi-master cable, manual; delivered in a practical box  German B9 <b>6ES7 298-0AA20-0AA3</b> English B9 <b>6ES7 298-0AA20-0BA3</b>
<b>CPU 222</b> Compact CPU, expandable, main memory 4 KB, power supply 24 V DC, 8 DI/6 DO integrated  Compact CPU, expandable, main memory 4 KB, power supply 100 V to 230 V AC, 8 DI/6 DO integrated, relay outputs	<b>6ES7 212-1AB23-0XB0</b>  <b>6ES7 212-1BB23-0XB0</b>	<b>MC 291 memory module, EEPROM</b> for CPU 221/222//224/224 XP/226 64 KB <b>6ES7 291-8GF23-0XA0</b> 256 KB <b>6ES7 291-8GH23-0XA0</b>
<b>CPU 224</b> Compact CPU, expandable, main memory 8/12 KB program, 8 KB data, power supply 24 V DC, 14 DI/10 DO integrated  Compact CPU, expandable, main memory 8/12 KB program, 8 KB data, power supply 100 V to 230 V AC, 14 DI/10 DO integrated, relay outputs	<b>6ES7 214-1AD23-0XB0</b>  <b>6ES7 214-1BD23-0XB0</b>	<b>Ground terminal</b> <b>6ES5 728-8MA11</b> 10 units <b>Front flap set</b> <b>6ES7 291-3AX20-0XA0</b> contains various cover flaps for CPUs and EMs; spare part
<b>CPU 224 XP</b> Compact CPU, expandable, main memory 12/16 KB program, 10 KB data, power supply 24 V DC, 14 DI/10 DO/ 2 AI/1 AO integrated  Compact CPU, expandable, main memory 12/16 KB program, 10 KB data, power supply 100 V to 230 V AC, 14 DI/10 DO (relay outputs)/ 2 AI/1 AO integrated	<b>6ES7 214-2AD23-0XB0</b>  <b>6ES7 214-2BD23-0XB0</b>	<b>SIM 274 simulator (optional)</b> with 8 terminals for CPU 221/222 <b>6ES7 274-1XF00-0XA0</b> with 14 terminals for CPU 224/224 XP <b>6ES7 274-1XH00-0XA0</b> with 24 terminals for CPU 226 <b>6ES7 274-1XK00-0XA0</b>
<b>CPU 224 XPsi</b> Compact CPU, with current-sinking outputs, expandable, main memory 12/16 KB program, 10 KB data, power supply 24 V DC, 14 DI/10 DO/ 2 AI/1 AO integrated	<b>6ES7 214-2AS23-0XB0</b>	<b>Pluggable terminal block (spare part)</b> With 12 terminals (for CPU 22x) B7 <b>6ES7 292-1AE20-0AA0</b> With 18 terminals B7 <b>6ES7 292-1AG20-0AA0</b> (for CPU 224/224 XP) With 14 terminals (for CPU 226) B7 <b>6ES7 292-1AF20-0AA0</b>
<b>CPU 226</b> Compact CPU, expandable, main memory 16/24 KB program, 10 KB data, power supply 24 V DC, 24 DI/16 DO integrated  Compact CPU, expandable, main memory 16/24 KB program, 10 KB data, power supply 100 V to 230 V AC, 24 DI/16 DO integrated, relay outputs	<b>6ES7 216-2AD23-0XB0</b>  <b>6ES7 216-2BD23-0XB0</b>	<b>Intelligent RS 232/PPI multi-master cable</b> <b>6ES7 901-3CB30-0XA0</b> For connecting devices with an RS 232 interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network <b>Intelligent USB/PPI multi-master cable</b> <b>6ES7 901-3DB30-0XA0</b> For connecting devices with an USB interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network
		<b>MPI cable</b> <b>6ES7 901-0BF00-0AA0</b> 5 m; for connecting the S7-200 to MPI
		<b>Backplane bus expansion cable</b> B7 <b>6ES7 290-6AA20-0XA0</b> For interconnection of the two rows of modules with double-tier configuration, for CPU 222/224/224 XP/226
		<b>Optional battery module</b> <b>6ES7 291-8BA20-0XA0</b>
		<b>Optional combined clock and battery module</b> <b>6ES7 297-1AA23-0XA0</b> only for CPU 221/222

B7: Subject to export regulations: AL: N and ECCN: EAR99H  
B9: Subject to export regulations: AL: N and ECCN: EAR99T

# SIMATIC S7-200

## Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 224 XPSi, CPU 226

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Ordering Data (continued)	Order No.	Order No.
<b>S7-200 Programmable Controller, System Manual</b> for CPU 221/222/224/224 XP/226 and STEP 7 Micro/Win V4 German <b>6ES7 298-8FA24-8AH0</b> English <b>6ES7 298-8FA24-8BH0</b> French <b>6ES7 298-8FA24-8CH0</b> Spanish <b>6ES7 298-8FA24-8DH0</b> Italian <b>6ES7 298-8FA24-8EH0</b> Chinese <b>6ES7 298-8FA24-8FH0</b>		<b>STEP 7-Micro/WIN V4 programming software</b> <i>Target system:</i> All CPUs of the SIMATIC S7-200 <i>Prerequisite:</i> Windows 2000/XP on programming device or PC <i>Type of delivery:</i> German, English, French, Spanish, Italian, Chinese; with online documentation Single license B8 <b>6ES7 810-2CC03-0YX0</b> Upgrade Single License <sup>1)</sup> B8 <b>6ES7 810-2CC03-0YX3</b>
<b>SIMATIC Manual Collection</b> B3 <b>6ES7 998-8XC01-8YE0</b> 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		<b>PROFIBUS bus connector, IP20 with 90° cable outlet</b> <ul style="list-style-type: none"> <li>Without PG connection <b>6ES7 972-0BA12-0XA0</b></li> <li>With PG connection <b>6ES7 972-0BB12-0XA0</b></li> </ul>
<b>SIMATIC Manual Collection update service for 1 year</b> B3 <b>6ES7 998-8XC01-8YE2</b> Current "Manual Collection" DVD and the three subsequent updates		<b>PROFIBUS bus connector, IP20 with 35° cable outlet</b> <ul style="list-style-type: none"> <li>Without PG connection <b>6ES7 972-0BA41-0XA0</b></li> <li>With PG connection <b>6ES7 972-0BB41-0XA0</b></li> </ul>
		<b>PROFIBUS FC standard cable</b> <b>6XV1 830-0EH10</b> For connection to PPI; 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> <b>6ES7 972-0AA01-0XA0</b>

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

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

B8: Subject to export regulations: AL: N and ECCN: EAR99S

# SIMATIC S7-200

## SIPLUS Central processing units

SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 226

### Overview SIPLUS CPU 221



- The clever compact solution
- With 10 input/outputs on board
- Cannot be expanded

SIPLUS CPU 221		
<b>Order No.</b>	<b>6AG1 211-0AA23-2XB0</b>	<b>6AG1 211-0BA23-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 211-0AA23-0XB0</b>	<b>6ES7 211-0BA23-0XB0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

### Overview SIPLUS CPU 222



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

SIPLUS CPU 222		
<b>Order No.</b>	<b>6AG1 212-1AB23-2XB0</b>	<b>6AG1 212-1BB23-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 212-1AB23-0XB0</b>	<b>6ES7 212-1BB23-0XB0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

# SIMATIC S7-200

## SIPLUS Central processing units

SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP,  
CPU 226

### Overview SIPLUS CPU 224



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

SIPLUS CPU 224		
Order No.	6AG1 214-1AD23-2XB0	6AG1 214-1BD23-2XB0
Order No. based on	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

### Overview SIPLUS CPU 224 XP



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

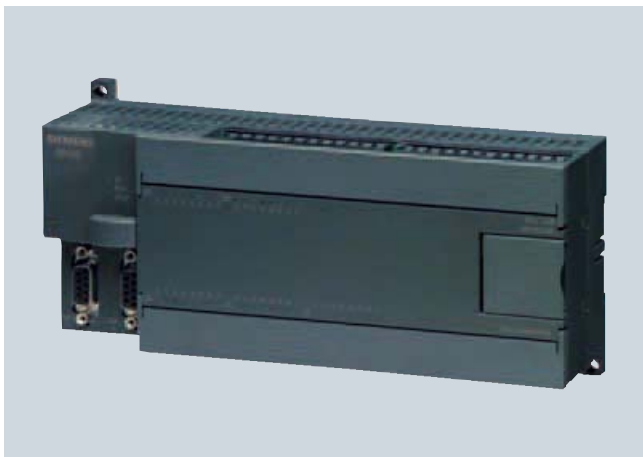
SIPLUS CPU 224 XP		
Order No.	6AG1 214-2AD23-2XB0	6AG1 214-2BD23-2XB0
Order No. based on	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0
Ambient temperature range	-25 ... +70 °C; condensation permitted	
Ambient conditions	Suited for exceptional medial exposure (e. g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No	No
Certifications and approvals	CE	
Technical data	The technical data are identical with those of the based on modules.	

# SIMATIC S7-200

## SIPLUS Central processing units

SIPLUS CPU 221, CPU 222, CPU 224, CPU 224 XP, CPU 226

### Overview SIPLUS CPU 226



- The power packet for larger technical tasks
- With additional PPI connection for even more flexibility and communication facilities
- With 40 input/outputs on board
- Expandable with up to 7 expansion modules

SIPLUS CPU 226		
Order No.	<b>6AG1 216-2AD23-2XB0</b>	<b>6AG1 216-2BD23-2XB0</b>
Order No. based on	<b>6ES7 216-2AD23-0XB0</b>	<b>6ES7 216-2BD23-0XB0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

### Ordering Data

#### SIPLUS CPU 221

(extended temperature and media exposure)

Compact CPU, main memory 4 KB, power supply 24 V DC, 6 DI/4 DO integrated B7 **6AG1 211-0AA23-2XB0**

Compact CPU, main memory 4 KB, power supply 100 to 230 V AC, 6 DI/4 DO integrated, relay outputs B7 **6AG1 211-0BA23-2XB0**

#### SIPLUS CPU 222

(extended temperature and media exposure)

Compact CPU, expandable, main memory 4 KB, power supply 24 V DC, 8 DI/6 DO integrated B7 **6AG1 212-1AB23-2XB0**

Compact CPU, expandable, main memory 4 KB, power supply 100 to 230 V AC, 8 DI/6 DO integrated, relay outputs B7 **6AG1 212-1BB23-2XB0**

#### SIPLUS CPU 224

(extended temperature and media exposure)

Compact CPU, expandable, main memory 8 KB, power supply 24 V DC, 14 DI/10 DO integrated B7 **6AG1 214-1AD23-2XB0**

Compact CPU, expandable, main memory 8 KB, power supply 100 to 230 V AC, 14 DI/10 DO integrated, relay outputs B7 **6AG1 214-1BD23-2XB0**

#### SIPLUS CPU 224 XP

(extended temperature and media exposure)

Compact CPU, expandable, main memory 12/16 KB program, 10 KB data, power supply 24 V DC, 14 DI/10 DO/2 AI/1 AO integrated **6AG1 214-2AD23-2XB0**

Compact CPU, expandable, main memory 12 KB program, 8 KB data, power supply 100 to 230 V AC, 14 DI/10 DO (relay outputs)/2 AI/1 AO integrated B7 **6AG1 214-2BD23-2XB0**

#### SIPLUS CPU 226

(extended temperature and media exposure)

Compact CPU, expandable, main memory 16/24 KB program, 10 KB data, power supply 24 V DC, 24 DI/16 DO integrated B7 **6AG1 216-2AD23-2XB0**

Compact CPU, expandable, main memory 16/24 KB program, 10 KB data, power supply 100 to 230 V AC, 24 DI/16 DO integrated, relay outputs B7 **6AG1 216-2BD23-2XB0**

#### Accessories

see SIMATIC S7-200 central processing units, page 3/18

B7: Subject to export regulations: AL: N and ECCN: EAR99H



### 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 EM 221

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
<b>Current consumption</b>			
from backplane bus DC 5 V, max.	70 mA	30 mA	30 mA
<b>Current consumption/power loss</b>			
Power loss, typ.	3 W	2 W	3 W
<b>Connection point</b>			
pluggable I/O terminals	Yes	Yes	Yes
<b>Digital inputs</b>			
Number of digital inputs	16	8	8
m/p-reading	Yes	Yes	
Input characteristic curve to IEC 1131, type 1	Yes		Yes
Input voltage			
• Rated value, AC			230 V; 220/230 V AC (47 to 63 Hz)
• Rated value, DC	24 V	24 V	
• for signal "0"	0 to 5 V	0 to 5 V	up to 20 V AC
• for signal "1"	15 to 30 V	15 to 30 V	79 V AC or more
Input current			
• for signal "1", typ.	4 mA	4 mA	2,5 mA
Input delay (for rated value of input voltage)			
• for standard inputs - at "0" to "1", max.	4.5 ms	4.5 ms	15 ms
Cable length			
• cable length, shielded, max.	500 m	500 m	500 m
• cable length unshielded, max.	300 m	300 m	300 m
<b>Encoder</b>			
Connectable encoders			
• 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA	Yes 1 mA	Yes 1 mA
<b>Isolation</b>			
Galvanic isolation, digital inputs			
• galvanic isolation, digital inputs	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
• between the channels, in groups of	4	4	1; (8 groups)

# SIMATIC S7-200

## Digital modules

### EM 221, EM 222, EM 223

#### Technical specifications EM 221 (continued)

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
<b>Dimensions</b>			
Dimensions			
• Width	71.2 mm	46 mm	71.2 mm
• Height	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm
<b>Weights</b>			
• Weight, approx.	160 g	150 g	160 g

#### Technical specifications EM 222

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0
<b>Supply voltages</b>		
Load voltage L+		
• Rated value (DC)	24 V	24 V
• permissible range, lower limit (DC)	20,4 V	20,4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Current consumption</b>		
from backplane bus DC 5 V, max.	40 mA	50 mA
<b>Current consumption/power loss</b>		
Power loss, typ.	3 W	2 W
<b>Connection point</b>		
pluggable I/O terminals	Yes	Yes
<b>Digital outputs</b>		
Number of digital outputs	4	8
Short-circuit protection of the output	No	No; to be provided externally (see manual package "Setting up an S7-200")
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)
<b>Output voltage</b>		
• for signal "1", min.	20 V DC	20 V
<b>Output current</b>		
• for signal "1" permissible range for 0 to 55 °C, max.	5 A	750 mA
• for signal "0" residual current, max.	30 µA	10 µA
<b>Parallel switching of 2 outputs</b>		
• for increased power		Yes
<b>Aggregate current of the outputs (per group)</b>		
• horizontal installation - up to 55 °C, max.	20 A	3 A
• up to 40 °C, max.	20 A	3 A
• maximum current per conductor/group	5 A	3 A
• cable length, shielded, max.	500 m	500 m
• cable length unshielded, max.	150 m	150 m
<b>Relay outputs</b>		
Switching capacity of the contacts		
• with inductive load, max.	5 A	0,75 A
• on lamp load, max.	50 W	5 W
• with resistive load, max.	5 A	0,75 A
<b>Isolation</b>		
Isolation, digital outputs		
• Galvanic isolation, digital outputs	Yes	Yes; Optocoupler
• between the channels, in groups of	1	4

**Technical specifications EM 222 (continued)**

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0
<b>Dimensions</b>		
Dimensions		
• Width	45 mm	45 mm
• Height	80 mm	80 mm
• Depth	62 mm	62 mm
<b>Weights</b>		
• Weight, approx.	120 g	150 g

	6ES7 222-1HD22-0XA0	6ES7 222-1HF22-0XA0	6ES7 222-1EF22-0XA0
<b>Supply voltages</b>			
Load voltage L+			
• Rated value (DC)	24 V	24 V	
• permissible range, lower limit (DC)	12 V	5 V	
• permissible range, upper limit (DC)	30 V	30 V	
Load voltage L1			
• Rated value (AC)	24 V; 24 to 230 V AC	24 V; 24 to 230 V AC	230 V; 220/230 V AC
• permissible range, lower limit (AC)	12 V	5 V	65 V
• permissible range, upper limit (AC)	250 V	250 V	264 V
• permissible frequency range, lower limit		47 Hz	47 Hz
• permissible frequency range, upper limit		63 Hz	63 Hz
<b>Current consumption</b>			
from backplane bus DC 5 V, max.	30 mA	40 mA	110 mA
Digital outputs			
• from load voltage L+, max.	80 mA; 20 mA per switched output	72 mA; 9 mA per switched output	
<b>Current consumption/power loss</b>			
Power loss, typ.	4 W	2 W	4 W
<b>Connection point</b>			
pluggable I/O terminals	Yes	Yes	Yes
<b>Digital outputs</b>			
Number of digital outputs	4; Relay	8; Relay	8
Short-circuit protection of the output	No; to be provided externally (see manual package "Setting up an S7-200")	No; to be provided externally (see manual package "Setting up an S7-200")	No; to be provided externally (see manual package "Setting up an S7-200")
Limitation of inductive shutdown voltage to	to be provided externally (see manual package "Setting up an S7-200")	to be provided externally (see manual package "Setting up an S7-200")	to be provided externally (see manual package "Setting up an S7-00")
<b>Output voltage</b>			
• for signal "1", min.			L1 (-0,9 V)
<b>Output current</b>			
• for signal "1" permissible range for 0 to 55 °C, max.	10 A	2 A	500 mA; AC
• for signal "1" minimum load current			50 mA
• for signal "0" residual current, max.	0 mA	0 mA	1.8 mA; at 264 V AC
<b>Aggregate current of the outputs (per group)</b>			
• horizontal installation - up to 55 °C, max.	20 A	8 A	0,5 A
• up to 40 °C, max.	40 A	8 A	0,5 A
• maximum current per conductor/group	10 A	8 A	0,5 A
• cable length, shielded, max.	500 m	500 m	500 m
• cable length unshielded, max.	150 m	150 m	150 m

# SIMATIC S7-200

## Digital modules

### EM 221, EM 222, EM 223

#### Technical specifications EM 222 (continued)

	6ES7 222-1HD22-0XA0	6ES7 222-1HF22-0XA0	6ES7 222-1EF22-0XA0
<b>Relay outputs</b>			
Number of operating cycles	3E7; mechanically 30 million, at rated load voltage 30,000	1E7; mechanically 10 million, at rated load voltage 100,000	
Switching capacity of the contacts			
• with inductive load, max.	3 A; 2 A (DC), 3 A (AC)	2 A	0,5 A
• on lamp load, max.	1 000 W; 100/1000 W (DC/AC)	200 W; 30 W DC; 200 W AC	60 W
• with resistive load, max.	10 A	2 A	0,5 A
<b>Isolation</b>			
Isolation, digital outputs			
• Galvanic isolation, digital outputs	Yes; Relay	Yes; Relay	Yes; Optocoupler
• between the channels, in groups of	1; 4 groups	4	1; 8 groups
<b>Dimensions</b>			
Dimensions			
• Width	45 mm	45 mm	71.2 mm
• Height	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm
Weights			
• Weight, approx.	150 g	170 g	170 g

#### Technical specifications EM 223

	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0	6ES7 223-1BM22-0XA0
<b>Supply voltages</b>				
Load voltage L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V
<b>Current consumption</b>				
from backplane bus DC 5 V, max.	40 mA	80 mA	160 mA	240 mA
from sensor current supply or external current supply (DC 24 V), max.				128 mA; ON: 4 mA/input
<b>Current consumption/power loss</b>				
Power loss, typ.	2 W	3 W	6 W	9 W
<b>Connection point</b>				
pluggable I/O terminals	Yes	Yes	Yes	Yes
<b>Digital inputs</b>				
Number of digital inputs	4	8	16	32
Input voltage				
• Rated value, DC	24 V	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	0 to 5 V	0 to 5 V
• for signal "1"	15 to 30 V DC	15 to 30 V DC	15 to 30 V DC	15 to 30 V DC
Input current				
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage)				
• for standard inputs - at "0" to "1", max.	4.5 ms	4.5 ms	4.5 ms	4.5 ms

**Technical specifications EM 223 (continued)**

	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0	6ES7 223-1BM22-0XA0
<b>Digital outputs</b>				
Number of digital outputs	4	8	16	32
Short-circuit protection of the output	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)	L+ (-48 V)
Output voltage				
• for signal "0" (DC), max.	0.1 V	0.1 V	0.1 V	0.1 V
• for signal "1", min.	20 V	20 V	20 V	20 V
Output current				
• for signal "1" rated value	750 mA	750 mA	750 mA	750 mA
Aggregate current of the outputs (per group)				
• maximum current per conductor/group	3 A	3 A	3 A; 3 / 3 / 6	0.75 A; 10 A per group
• cable length, shielded, max.	500 m	500 m	500 m	500 m
• cable length unshielded, max.	150 m	150 m	150 m	150 m
<b>Relay outputs</b>				
Switching capacity of the contacts				
• with inductive load, max.	0.75 A; each output	0.75 A; each output	0.75 A; each output	0.75 A; each output
• on lamp load, max.	5 W	5 W	5 W	5 W
• with resistive load, max.	0.75 A; each output	0.75 A; each output	0.75 A; each output	0.75 A; each output
<b>Encoder</b>				
Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA	1 mA
<b>Isolation</b>				
Isolation checked with	500 V AC	500 V AC	500 V AC	500 V AC
<b>Isolation</b>				
Galvanic isolation, digital inputs				
• galvanic isolation, digital inputs	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
• between the channels, in groups of	4	4	4	16; 2 groups with 16 inputs each
Isolation, digital outputs				
• Galvanic isolation, digital outputs	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
• between the channels, in groups of	4	4	4; 4 / 4 / 8	16; 2 groups with 16 outputs each
<b>Dimensions</b>				
Dimensions				
• Width	46 mm	71.2 mm	137.5 mm	196 mm
• Height	80 mm	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm	62 mm
Weights				
• Weight, approx.	160 g	200 g	360 g	500 g

# SIMATIC S7-200

## Digital modules

### EM 221, EM 222, EM 223

#### Technical specifications EM 223 (continued)

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0	6ES7 223-1PM22-0XA0
<b>Supply voltages</b>				
Load voltage L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	5 V	5 V	5 V	5 V
• permissible range, upper limit (DC)	30 V	30 V	30 V	30 V
Load voltage L1				
• Rated value (AC)	230 V; 24 to 230 V AC	230 V; 24 to 230 V AC	230 V; 24 to 230 V AC	230 V; 24 to 230 V AC
• permissible range, lower limit (AC)	5 V	5 V	5 V	5 V
• permissible range, upper limit (AC)	250 V	250 V	250 V	250 V
<b>Current consumption</b>				
from backplane bus DC 5 V, max.	40 mA	80 mA	150 mA	205 mA
from coil current, max.	9 mA; for each output on signal "1"	9 mA; for each output on signal "1"	9 mA; for each output on signal "1"	9 mA; for each output on signal "1"
from sensor current supply or external current supply (DC 24 V), max.	72 mA	72 mA	72 mA	128 mA
<b>Current consumption/power loss</b>				
Power loss, typ.	2 W	3 W	6 W	13 W
<b>Connection point</b>				
pluggable I/O terminals	Yes	Yes	Yes	Yes
<b>Digital inputs</b>				
Number of digital inputs	4	8	16	32
Input voltage				
• Rated value, DC	24 V	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	0 to 5 V	0 to 5 V
• for signal "1"	15 to 30 V DC	15 to 30 V DC	15 to 30 V DC	15 to 30 V DC
Input current				
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage)				
• for standard inputs - at "0" to "1", max.	4.5 ms	4.5 ms	4.5 ms	4.5 ms
<b>Digital outputs</b>				
Number of digital outputs	4; Relay	8; Relay	16; Relay	32; Relay
Short-circuit protection of the output	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Output voltage				
• for signal "0" (DC), max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load
• for signal "1", min.	L+/L1	L+/L1	L+/L1	L+/L1
Output current				
• for signal "1" rated value	2 000 mA	2 000 mA	2 000 mA	2 000 mA
Aggregate current of the outputs (per group)				
• maximum current per conductor/group	8 A	8 A	8 A	2 A; 10 A per group
• cable length, shielded, max.	500 m	500 m	500 m	500 m
• cable length unshielded, max.	150 m	150 m	150 m	150 m

**Technical specifications EM 223 (continued)**

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0	6ES7 223-1PM22-0XA0
<b>Relay outputs</b>				
Number of operating cycles	1E7; mechanically 10 million, at rated load voltage 100,00	1E7; mechanically 10 million, at rated load voltage 100,000	1E7; mechanically 10 million, at rated load voltage 100,000	1E7; 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	0.75 A; each output	0.75 A; each output
• on lamp load, max.	200 W; 30 W DC; 200 W AC	200 W; 30 W DC; 200 W AC	200 W; 30 W DC; 200 W AC	200 W; 30 W DC; 200 W AC
• with resistive load, max.	0.75 A; each output	0.75 A; each output	0.75 A; each output	2 A; each output
<b>Encoder</b>				
Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA	1 mA
<b>Isolation</b>				
Isolation checked with	500 V AC	500 V AC	500 V AC	500 V AC
<b>Isolation</b>				
Galvanic isolation, digital inputs				
• galvanic isolation, digital inputs	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
• between the channels, in groups of	4	4	8	16
Isolation, digital outputs				
• Galvanic isolation, digital outputs	Yes; Relay	Yes; Relay	Yes; Relay	Yes; Relay
• between the channels, in groups of	4	4	4	11; 11/11/10
<b>Dimensions</b>				
Dimensions				
• Width	46 mm	71.2 mm	137.5 mm	196 mm
• Height	80 mm	80 mm	80 mm	80 mm
• Depth	62 mm	62 mm	62 mm	62 mm
Weights				
• Weight, approx.	160 g	300 g	400 g	580 g



# SIMATIC S7-200

## Digital modules

EM 221, EM 222, EM 223

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**Ordering Data****Order No.****Order No.****Digital input module EM 221**

for CPU 221/222/224/224 XP/226

- 8 inputs, 24 V DC, isolated, current sourcing/sinking
- 16 inputs, 24 V DC, isolated, current sourcing/sinking
- 8 inputs, 120/230 V AC, isolated, current sourcing/sinking B7

**6ES7 221-1BF22-0XA0****6ES7 221-1BH22-0XA0****6ES7 221-1EF22-0XA0****Digital output module EM 222**

for CPU 221/222/224/224 XP/226

- 4 outputs, 24 V DC; 5A, isolated B7
- 8 outputs, 24 V DC; 0.75 A, isolated
- 4 outputs, 24 V DC, 24 to 230 V AC; 10 A, isolated, relay outputs B7
- 8 outputs, 24 V DC, 24 to 230 V AC; 2 A, isolated, relay outputs
- 8 outputs, 120/230 V AC; 0.5 A, isolated

**6ES7 222-1BD22-0XA0****6ES7 222-1BF22-0XA0****6ES7 222-1HD22-0XA0****6ES7 222-1HF22-0XA0****6ES7 222-1EF22-0XA0****Digital input/output module EM 223**

for CPU 221/222/224/224 XP/226

- 4 inputs 24V DC, 4 outputs 24 V DC; 0.75 A, isolated
- 8 inputs, 24V DC, 8 outputs 24 V DC; 0.75 A, isolated
- 16 inputs, 24V DC, 16 outputs 24 V DC; 0.75 A, isolated
- 32 inputs, 24V DC, 32 outputs 24 V DC; 0.75 A, isolated
- 4 inputs, 24 V DC; 4 outputs, relays
- 8 inputs, 24 V DC; 8 outputs, relays
- 16 inputs, 24 V DC; 16 outputs, relays
- 32 inputs, 24 V DC; 32 outputs, relays

**6ES7 223-1BF22-0XA0****6ES7 223-1BH22-0XA0****6ES7 223-1BL22-0XA0****6ES7 223-1BM22-0XA0****6ES7 223-1HF22-0XA0****6ES7 223-1PH22-0XA0****6ES7 223-1PL22-0XA0****6ES7 223-1PM22-0XA0****Front flap set**

contains various cover flaps for CPUs and EMs; spare part

**6ES7 291-3AX20-0XA0****Pluggable terminal block (spare part)**

- With 7 terminals (for EM 221/222) B7 **6ES7 292-1AD20-0AA0**
- With 12 terminals (for EM 223) B7 **6ES7 292-1AE20-0AA0**

**SIM 274 simulator (optional)**

with 8 terminals for EM 221 and EM 223

**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**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



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

#### SIPLUS EM 221 digital input modules for CPU 22x

	8 DI	16 DI
<b>Order No.</b>	<b>6AG1 221-1BF22-2XA0</b>	<b>6AG1 221-1BH22-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 221-1BF22-0XA0</b>	<b>6ES7 221-1BH22-0XA0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

#### SIPLUS EM 222 digital output modules for CPU 22x

	8DO	8RO
<b>Order No.</b>	<b>6AG1 222-1BF22-2XB0</b>	<b>6AG1 222-1HF22-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 222-1BF22-0XB0</b>	<b>6ES7 222-1HF22-0XB0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

# SIMATIC S7-200

## SIPLUS digital modules

### SIPLUS EM 221, EM 222, EM 223

#### Overview (continued)

SIPLUS EM 223 digital input/output modules for CPU 22x			
	4 DI / 4 DO	8 DI / 8 DO	16 DI / 16 DO
Order No.	6AG1 223-1BF22-2XB0	6AG1 223-1BH22-2XB0	6AG1 223-1BL22-2XB0
Order No. based on	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible		
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).		
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes
Approvals	CE, cUL		
Technical specifications	The technical data are identical with those of the based-on modules.		

SIPLUS EM 223 digital input/output modules for CPU 22x			
	4 DI / 4 DO	8 DI / 8 DO	16 DI / 16 DO
Order No.	6AG1 223-1HF22-2XB0	6AG1 223-1PH22-2XB0	6AG1 223-1PL22-2XB0
Order No. based on	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible		
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).		
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes	Yes	Yes
Approvals	CE, cUL		
Technical specifications	The technical data are identical with those of the based-on modules.		

#### Ordering Data

Ordering Data	Order No.	Ordering Data	Order No.
<b>Digital input module</b> <b>SIPLUS EM 221</b> (extended temperature and medial exposure) for CPU 222/224/224 XP/226 <ul style="list-style-type: none"> <li>• 8 inputs, 24 V DC, isolated, source/sink output</li> <li>• 16 inputs, 24 V DC, isolated, source/sink output</li> </ul>	B7 <b>6AG1 221-1BF22-2XB0</b>  B7 <b>6AG1 221-1BH22-2XA0</b>	<b>Digital input/output module</b> <b>SIPLUS EM 223</b> (extended temperature and medial exposure) for CPU 222/224/224 XP/226 <ul style="list-style-type: none"> <li>• 4 inputs 24 V DC, 4 outputs 24 V DC; 0,75 A, isolated</li> <li>• 8 inputs, 24 V DC, 8 outputs, 24 V DC; 0,75 A, isolated</li> <li>• 16 inputs, 24 V DC, 16 outputs, 24 V DC; 0,75 A, isolated</li> <li>• 4 inputs 24 V DC, 4 outputs, relay</li> <li>• 8 inputs, 24 V DC, 8 outputs, relay</li> <li>• 16 inputs, 24 V DC, 16 outputs, relay</li> </ul>	B7 <b>6AG1 223-1BF22-2XB0</b>  B7 <b>6AG1 223-1BH22-2XB0</b>  B7 <b>6AG1 223-1BL22-2XB0</b>  B7 <b>6AG1 223-1HF22-2XB0</b>  B7 <b>6AG1 223-1PH22-2XB0</b>  B7 <b>6AG1 223-1PL22-2XB0</b>
<b>Digital input module</b> <b>SIPLUS EM 222</b> (extended temperature and medial exposure) for CPU 222/224/224 XP/226 <ul style="list-style-type: none"> <li>• 8 outputs, 24 V DC; 0,75 A, isolated</li> <li>• 8 outputs, 24 V DC/24 to 230 V AC; 2 A, isolated, relay outputs</li> </ul>	B7 <b>6AG1 222-1BF22-2XB0</b>  B7 <b>6AG1 222-1HF22-2XB0</b>	<b>Accessories</b> see S7-200 digital modules, page 3/30	

B7: Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



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

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### Technical specifications EM 231

	6ES7 231-0HC22-0XA0	6ES7 231-0HF22-0XA0
<b>Current consumption</b>		
from load voltage L+ (without load), max.	60 mA	60 mA
from backplane bus DC 5 V, max.	20 mA	20 mA
<b>Current consumption/power loss</b>		
Power loss, typ.	2 W	2 W
<b>Connection point</b>		
pluggable I/O terminals	No	No
<b>Analog inputs</b>		
Number of analog inputs	4; Difference	8; Difference
cable length, shielded, max.	100 m; to the sensor	100 m; to the sensor
Input ranges (rated values), voltages		
• 0 to +5 V	Yes	Yes
• 0 to +10 V	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes
• -5 V to +5 V	Yes	Yes
• -80 mV to +80 mV		No
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes; for channels 6 and 7 only

	6ES7 231-0HC22-0XA0	6ES7 231-0HF22-0XA0
Input ranges (rated values), thermoelements		
• Type E		No
• Type J		No
• Type K		No
• Type N		No
• Type R		No
• Type S		No
• Type T		No
Input ranges (rated values), resistance thermometers		
• Cu 10		No
• Ni 10		No
• Ni 1000		No
• Ni 120		No
• Pt 100		No
• Pt 1000		No
• Pt 10000		No
• Pt 200		No
• Pt 500		No
Input ranges (rated values), resistors		
• 0 to 150 Ohm		No
• 0 to 300 Ohm		No
• 0 to 600 Ohm		No
• permissible input frequency for voltage input (destruction limit), max.	30 V	30 V
• permissible input current for current input (destruction limit), max.	32 mA	40 mA

# SIMATIC S7-200

## Analog modules

### EM 231, EM 232, EM 235

#### Technical specifications EM 231 (continued)

	6ES7 231-0HC22-0XA0	6ES7 231-0HF22-0XA0
Characteristic curve linearization		
• for voltage measurement	No	No
• for current measurement	No	No
Temperature compensation		
• programmable	No	No
<b>Analog value creation</b>		
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	12 Bit	12 Bit
• Interference voltage suppression for interference frequency $f_1$ in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC up to 60 V for interference frequency
• Conversion time (per channel)	250 $\mu$ s	250 $\mu$ s
Displayable conversion value range		
• bipolar signals	-32,000 to +32,000	-32,000 to +32,000
• unipolar signals	0 to 32,000	0 to 32,000

	6ES7 231-0HC22-0XA0	6ES7 231-0HF22-0XA0
<b>Errors/accuracies</b>		
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency		
• common mode voltage, max.	12 V	12 V
<b>Isolation</b>		
Isolation, analog inputs		
• Isolation, analog inputs	No	No
<b>Dimensions</b>		
Dimensions		
• Width	71,2 mm	71,2 mm
• Height	80 mm	80 mm
• Depth	62 mm	62 mm
Weights		
• Weight, approx.	183 g	190 g

#### Technical specifications EM 232

	6ES7 232-0HB22-0XA0	6ES7 232-0HD22-0XA0
<b>Current consumption</b>		
from backplane bus DC 5 V, max.	20 mA	20 mA
from sensor current supply or external current supply (DC 24 V), max.	70 mA	70 mA
<b>Current consumption/power loss</b>		
Power loss, typ.	2 W	2 W
<b>Connection point</b>		
pluggable I/O terminals	No	No
<b>Analog outputs</b>		
Number of analog outputs	2	4
Output ranges, voltage		
• -10 to +10 V	Yes	Yes
Output ranges, current		
• 4 to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	5 k $\Omega$	5 k $\Omega$
• with current outputs, max.	0.5 k $\Omega$	0.5 k $\Omega$

	6ES7 232-0HB22-0XA0	6ES7 232-0HD22-0XA0
<b>Analog value creation</b>		
Integration and conversion time/resolution per channel		
• Resolution (incl. overload area)	V/12 bits, I/11 bits	V/12 bits, I/11 bits
Settling time		
• for voltage output	100 $\mu$ s	100 $\mu$ s
• for current output	2 ms	2 ms
Displayable conversion value range		
• bipolar signals	-32,000 to +32,000	-32,000 to +32,000
• unipolar signals	0 to 32,000	0 to 32,000
<b>Errors/accuracies</b>		
Operational limit in overall temperature range		
• Voltage, relative to output area	+/- 2 %	+/- 2 %
• Current, relative to output area	+/- 2 %	+/- 2 %
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output area	+/- 0.5 %	+/- 0.5 %
• Current, relative to output area	+/- 0.5 %	+/- 0.5 %

### Technical specifications EM 232 (continued)

	6ES7 232-0HB22-0XA0	6ES7 232-0HD22-0XA0
<b>Isolation</b>		
Isolation, analog outputs		
• Galvanic isolation, analog outputs	No	No

	6ES7 232-0HB22-0XA0	6ES7 232-0HD22-0XA0
<b>Dimensions</b>		
Dimensions		
• Width	46 mm	71.2 mm
• Height	80 mm	80 mm
• Depth	62 mm	62 mm
Weights		
• Weight, approx.	148 g	190 g

### Technical specifications EM 235

	6ES7 235-0KD22-0XA0
<b>Current consumption</b>	
from backplane bus DC 5 V, max.	30 mA
from sensor current supply or external current supply (DC 24 V), max.	60 mA
<b>Current consumption/power loss</b>	
Power loss, typ.	2 W
<b>Connection point</b>	
pluggable I/O terminals	No
<b>Analog inputs</b>	
Number of analog inputs	4; Difference
• Voltage	Yes
• Current	Yes
Input ranges (rated values), voltages	
• 0 to +50 mV	Yes
• 0 to +100 mV	Yes
• 0 to +500 mV	Yes
• 0 to +1 V	Yes
• 0 to +5 V	Yes
• 0 to +10 V	Yes
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -100 mV to +100 mV	Yes
• -2.5 V to +2.5 V	Yes
• -25 mV to +25 mV	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• permissible input frequency for voltage input (destruction limit), max.	30 V
• permissible input current for current input (destruction limit), max.	32 mA

	6ES7 235-0KD22-0XA0
Characteristic curve linearization	
• for voltage measurement	No
• for current measurement	No
Temperature compensation	
• programmable	No
<b>Analog outputs</b>	
Number of analog outputs	1
Output ranges, voltage	
• -10 to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	5 k $\Omega$
• with current outputs, max.	0.5 k $\Omega$
<b>Analog value creation</b>	
Integration and conversion time/resolution per channel	
• Resolution with overload area (bit including sign), max.	12 Bit; 11 bits for current output
• Basic conversion time, ms	< 0.25 ms
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Settling time	
• for voltage output	100 $\mu$ s
• for current output	2 ms
Displayable conversion value range	
• bipolar signals	-32,000 to +32,000
• unipolar signals	0 to 32,000
<b>Errors/accuracies</b>	
Operational limit in overall temperature range	
• Voltage, relative to output area	+/- 2 %
• Current, relative to output area	+/- 2 %

# SIMATIC S7-200

## Analog modules

### EM 231, EM 232, EM 235

#### Technical specifications EM 235 (continued)

6ES7 235-0KD22-0XA0	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output area	+/- 0.5 %
• Current, relative to output area	+/- 0.5 %
Interference voltage suppression for $f = n \times (fl \pm 1 \%)$ , $fl =$ interference frequency	
• common mode voltage, max.	12 V
<b>Isolation</b>	
Isolation, analog inputs	
• Isolation, analog inputs	No
Isolation, analog outputs	
• Galvanic isolation, analog outputs	No
<b>Dimensions</b>	
Dimensions	
• Width	71.2 mm
• Height	80 mm
• Depth	62 mm
Weights	
• Weight, approx.	186 g

#### Ordering Data

#### Order No.

##### Analog input module EM 231

for CPU 221/222/224/224 XP/226

4 inputs, 0 to 10 V,  
12 bit resolution

**6ES7 231-0HC22-0XA0**

8 inputs, 0 to 10 V, of which  
max. 2 inputs also 0 to 20 mA,  
11/12 bit resolution

**6ES7 231-0HF22-0XA0**

##### Analog output module EM 232

for CPU 221/222/224/224 XP/226

2 outputs,  $\pm 10$  V, 12 bit resolution

**6ES7 232-0HB22-0XA0**

4 outputs,  $\pm 10$  V, 12-bit resolution

**6ES7 232-0HD22-0XA0**

##### Analog input/output module EM 235

for CPU 222/224/224 XP/226;  
4 inputs, 1 output,  $\pm 10$  V DC,  
12 bit resolution

**6ES7 235-0KD22-0XA0**

##### Ground terminal

10 units

**6ES5 728-8MA11**

##### Front flap set

contains various cover flaps for  
CPUs and EMs; spare part

**6ES7 291-3AX20-0XA0**

##### 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**



### Overview



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

3

### Technical specifications

	6ES7 231-7PD22-0XA0	6ES7 231-7PF22-0XA0
<b>Current consumption</b>		
from load voltage L+ (without load), max.	60 mA	60 mA
from backplane bus DC 5 V, max.	87 mA	87 mA
<b>Current consumption/power loss</b>		
Power loss, typ.	1.8 W	1.8 W
<b>Connection point</b>		
pluggable I/O terminals	No	No
<b>Analog inputs</b>		
Number of analog inputs	4	8
cable length, shielded, max.	100 m; to the sensor	100 m; to the sensor
Loop resistance cable	100 $\Omega$	100 $\Omega$
Updating time (all channels)	405 ms	810 ms
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermoelements		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
Input ranges (rated values), resistors		
• permissible input frequency for voltage input (destruction limit), max.	30 V	30 V

	6ES7 231-7PD22-0XA0	6ES7 231-7PF22-0XA0
<b>Analog value creation</b>		
Measurement principle	Sigma Delta	Sigma Delta
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	16 Bit; Temperature 0.1 °C / 0.1 °F	16 Bit; T Temperature 0.1 °C / 0.1 °F
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Displayable conversion value range		
• bipolar signals	-27,648 to +27,648	-27,648 to +27,648
<b>Errors/accuracies</b>		
cold connection point	+/- 1.5 °C	+/- 1.5 °C
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %	+/- 0.05 %
Operational limit in overall temperature range		
• Voltage, relative to output area	+/- 0.1 %	+/- 0.1 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , f1 = interference frequency		
• common mode voltage, max.	120 V; AC	120 V; AC
• common mode voltage, min.	120 db; at 120 V AC	120 db; at 120 V AC

# SIMATIC S7-200

## Analog modules

### EM 231 thermocouple module

#### Technical specifications (continued)

	6ES7 231-7PD22-0XA0	6ES7 231-7PF22-0XA0
<b>Isolation</b>		
Isolation, analog inputs		
• Isolation, analog inputs	Yes	Yes
<b>Dimensions</b>		
Dimensions		
• Width	71.2 mm	71.2 mm
• Height	80 mm	80 mm
• Depth	62 mm	62 mm
<b>Weights</b>		
• Weight, approx.	210 g	210 g

#### Ordering Data

#### Order No.

##### Thermocouple module EM 231

Inputs +/- 80 mV,  
resolution 15 bit + sign,  
thermocouples J, K, S, T, R, E, N

4 inputs

**6ES7 231-7PD22-0XA0**

8 inputs

**6ES7 231-7PF22-0XA0**

##### Ground terminal

**6ES5 728-8MA11**

10 units

##### Backplane bus expansion cable

B7

**6ES7 290-6AA20-0XA0**

For interconnection of the two rows of devices with double-row configuration, for CPU 222/224/224 XP/226

##### 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**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



- To measure temperatures easily and with high accuracy
- 2 versions with 2 or 4 inputs
- The latest resistance temperature detectors can be used
- Easy to retrofit in existing systems

3

### Technical specifications

	6ES7 231-7PB22-0XA0	6ES7 231-7PC22-0XA0
<b>Current consumption</b>		
from load voltage L+ (without load), max.	60 mA	60 mA
from backplane bus DC 5 V, max.	87 mA	87 mA
<b>Current consumption/power loss</b>		
Power loss, typ.	1.8 W; Sensor: 1 mW	1.8 W; Sensor: 1 mW
<b>Connection point</b>		
pluggable I/O terminals	No	No
<b>Analog inputs</b>		
Number of analog inputs	2	4
cable length, shielded, max.	100 m; to the sensor	100 m; to the sensor
Loop resistance cable	20 Ω max. 2.7 Ohm for Cu	20 Ω max. 2.7 Ohm for Cu
Updating time (all channels)	405 ms; 700 ms with Pt10000	810 ms; 1400 ms with Pt10000
Input ranges (rated values), resistance thermometers		
• Cu 10	Yes	Yes
• Ni 10	Yes	Yes
• Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 10000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes

	6ES7 231-7PB22-0XA0	6ES7 231-7PC22-0XA0
Input ranges (rated values), resistors		
• 0 to 150 Ohm	Yes	Yes
• 0 to 300 Ohm	Yes	Yes
• 0 to 600 Ohm	Yes	Yes
• permissible input frequency for voltage input (destruction limit), max.	30 V; 30 V DC (probe), 5 V DC (source)	30 V; 30 V DC (probe), 5 V DC (source)
<b>Analog value creation</b>		
Measurement principle	Sigma Delta	Sigma Delta
Integration and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	16 Bit; Temperature 0.1 °C / 0.1 °F	16 Bit; Temperature 0.1 °C / 0.1 °F
• Interference voltage suppression for inter- ference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Displayable conversion value range		
• bipolar signals	-27,648 to +27,648	-27,648 to +27,648
<b>Errors/accuracies</b>		
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %	+/- 0.05 %
Operational limit in overall temperature range		
• Voltage, relative to output area	+/- 0.1 %	+/- 0.1 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , $f1 =$ interference frequency		
• common mode voltage, max.	0 V	0 V
• common mode voltage, min.	120 db; at 120 V AC	120 db; at 120 V AC

# SIMATIC S7-200

## Analog modules

### EM 231 RTD module

#### Technical specifications (continued)

	6ES7 231-7PB22-0XA0	6ES7 231-7PC22-0XA0
<b>Isolation</b>		
Isolation, analog inputs		
• Isolation, analog inputs	Yes	Yes
<b>Dimensions</b>		
Dimensions		
• Width	71.2 mm	71.2 mm
• Height	80 mm	80 mm
• Depth	62 mm	62 mm
<b>Weights</b>		
• Weight, approx.	210 g	210 g

#### Ordering Data

#### Order No.

##### RTD module EM 231

2 inputs for resistance temperature detector Pt100/200/500/1000/10000, Ni100/120/1000, Cu10; resistor 150/300/600 Ohm, resolution 15 Bit + sign

**6ES7 231-7PB22-0XA0**

4 inputs for resistance temperature detector Pt100/200/500/1000/10000, Ni100/120/1000, Cu10; 14 GOST temperature resistance sensors, resistor 150/300/600 ohm, resolution 15 bit + sign

**6ES7 231-7PC22-0XA0**

##### Ground terminal

10 units

**6ES5 728-8MA11**

##### Backplane bus expansion cable

B7

For interconnection of the two rows of devices with double-row configuration, for CPU 222/224/224 XP/226

**6ES7 290-6AA20-0XA0**

##### 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**

B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200 SIPLUS analog modules

## SIPLUS EM 231, EM 232, EM 235

### Overview



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

#### SIPLUS EM 231 analog input module for CPU 22x

	<b>4 AI</b>
<b>Order No.</b>	<b>6AG1 231-0HC22-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 231-0HC22-0XA0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	Yes
Approvals	CE, cUL
Technical specifications	The technical data are identical with those of the based-on modules.

#### SIPLUS EM 232 analog output modules for CPU 22x

	<b>2 AO</b>
<b>Order No.</b>	<b>6AG1 232-0HB22-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 232-0HB22-0XA0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No
Approvals	CE, cUL
Technical specifications	The technical data are identical with those of the based-on modules.

#### SIPLUS EM 235 analog input/output modules for CPU 22x

	<b>4 AI/1 AO</b>
<b>Order No.</b>	<b>6AG1 235-0KD22-2XB0</b>
<b>Order No. based on</b>	<b>6ES7 235-0KD22-0XA0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No
Approvals	CE, cUL
Technical specifications	The technical data are identical with those of the based-on modules.

#### Ordering Data

		<b>Order No.</b>
<b>SIPLUS EM 231 analog input module</b>	B7	<b>6AG1 231-0HC22-2XB0</b>
(enhanced temperature range and medial exposure)		
For CPU 222/224/224 XP/226; 4 inputs, 0 to 10 V, resolution 12 bit		
<b>SIPLUS EM 232 analog output module</b>	B7	<b>6AG1 232-0HB22-2XB0</b>
(enhanced temperature range and medial exposure)		
For CPU 222/224/224 XP/226; 2 outputs, ±10 V, resolution 12 bit		
<b>SIPLUS EM 235 analog input/output module</b>	B7	<b>6AG1 235-0KD22-2XB0</b>
(enhanced temperature range and medial exposure)		
For CPU 222/224/224 XP/226; 4 inputs, 1 output, ±10 V DC, resolution 12 bit		
<b>Accessories</b>		see S7-200 analog modules, page 3/36

B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200

## SIPLUS analog modules

### SIPLUS EM 231 RTD module

#### Overview



- To measure temperatures easily and with high accuracy
- 31 common resistance temperature detectors can be used
- Easy to retrofit in existing systems

#### SIPLUS EM 231 RTD module for CPU 22x

	2 AI Thermo	2 AI Thermo
<b>Order No.</b>	<b>6AG1 231-7PB22-2XA0</b>	<b>6AG1 231-7PB22-2XY0</b>
<b>Order No. based on</b>	<b>6ES7 231-7PB22-0XA0</b>	<b>6ES7 231-7PB22-0XA0</b>
Ambient temperature range	-25 ... +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Environmental conditions	Suited for exceptional medial exposure (e.g. by chlorine sulfur atmosphere).	
Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category 1).	No	Yes
Approvals	CE, cUL	
Technical specifications	The technical data are identical with those of the based-on modules.	

#### Ordering Data

#### Order No.

**SIPLUS EM 231 RTD module** B7 **6AG1 231-7PB22-2XA0**  
(enhanced temperature range and medial exposure)

2 inputs for  
resistance temperature detector  
Pt100/200/500/1000/10000,  
Ni100/120/1000, Cu10;  
resistor 150/300/600 Ohm,  
resolution 15 Bit + sign

**SIPLUS EM 231 RTD module** B7 **6AG1 231-7PB22-2XY0**  
(enhanced temperature range and medial exposure)

Conforming to EN 50155;  
2 inputs for  
resistance temperature detector  
Pt100/200/500/1000,  
Ni100/120/1000, Cu10;  
resistor 150/300/600 Ohm,  
resolution 15 bit + sign

#### Accessories

see S7-200 RTD module,  
page 3/40

B7: Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



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

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### Technical specifications

6ES7 253-1AA22-0XA0	
<b>Supply voltages</b>	
Rated value	
• permissible range, lower limit (DC)	11 V
• permissible range, upper limit (DC)	30 V
<b>Current consumption</b>	
from backplane bus DC 5 V, max.	190 mA
from supply voltage L+, max.	300 mA; from 12 V DC, 130 mA from 24 V DC
<b>Hardware config.</b>	
Number of modules per CPU	max. 5 with CPU 226/226XM, max. 3 with CPU 224, max. 1 with CPU 222
<b>Digital inputs</b>	
Number of digital inputs	5
Type	IEC Type 1, active-high
Functions	Stop (STP), reference point switch (RPS), upper limit switch (LMT+), lower limit switch (LMT-), zero point (ZP)
<b>Input voltage</b>	
• Rated value, DC	24 V
• for signal "0"	STP, RPS, LMT+, LMT- DC 5 V; ZP DC 1 V
• for signal "1"	STP, RPS, LMT+, LMT- DC 15 V; ZP DC 3 V
<b>Input delay (for rated value of input voltage)</b>	
• for standard inputs - programmable	Yes; STP, RPS, LMT+, LMT- 0.2 to 12.8 ms; ZP min 2 $\mu$ s
<b>Cable length</b>	
• cable length, shielded, max.	100 m; STP, RPS, LMT+, LMT- 100 m, ZP 10 m
• cable length unshielded, max.	30 m; STP, RPS, LMT+, LMT- 30 m, ZP not recommended

6ES7 253-1AA22-0XA0	
<b>Encoder</b>	
Connectable encoders	
• 2-wire BEROS - permissible quiescent current (2-wire BEROS), max.	Yes 1 mA
<b>Drive interface</b>	
Signal output I	
• Number	4; optionally RS 422/RS 485 or 5 V DC
• Type	RS 422 / RS 485 (P0+, P0-, P1+, P1-)
• Differential output voltage, min.	2.8 V; RL = 200 ohms
• Pulse frequency	200 kHz; (P0+, P0-, P1+, P1-, P0, P1)
• Cable length, max.	10 m; shielded; 1 m unshielded
Signal output III	
• Type	5 V DC (P0, P1, DIS, CLR)
• Output voltage	30 V DC
• Output current	50 mA; output delay (DIS, CLR) max. 30 $\mu$ s
<b>Isolation</b>	
Galvanic isolation, digital inputs	
• between the channels	Yes
• between the channels, in groups of	1 (STP, RPS, ZP), 2 (LMT-, LMT+)
<b>Dimensions</b>	
Dimensions	
• Width	71.2 mm
• Height	80 mm
• Depth	62 mm
Weights	
• Weight, approx.	190 g

# SIMATIC S7-200

## Function modules

### EM 253 positioning module

#### Ordering Data

##### EM 253 positioning modules

for activating stepper motors or servo drives

##### Grounding terminal

10 items

##### Backplane bus expansion cable

for connecting the two equipment tiers in a two-tier configuration, for CPU 222/224/224 XP/226

#### Order No.

**6ES7 253-1AA22-0XA0**

**6ES5 728-8MA11**

B7

**6ES7 290-6AA20-0XA0**

##### S7-200 programmable controller, system manual

for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4

German

English

French

Spanish

Italian

Chinese

#### Order No.

**6ES7 298-8FA24-8AH0**

**6ES7 298-8FA24-8BH0**

**6ES7 298-8FA24-8CH0**

**6ES7 298-8FA24-8DH0**

**6ES7 298-8FA24-8EH0**

**6ES7 298-8FA24-8FH0**

B7: Subject to export regulations: AL: N and ECCN: EAR99H



### Overview



SIWAREX MS is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-200 automation systems. The data for the actual weight can be accessed directly in the SIMATIC CPU without the need for any additional interfaces.

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### Technical specifications

SIWAREX MS	
Integration in S7-200 automation systems	
<ul style="list-style-type: none"> <li>• CPU 222 (6ES7212-1*B23-0XB0)</li> <li>• CPU 224 (6ES7214-1*D23-0XB0)</li> <li>• CPU 224XP (6ES7214-2*D23-0XB0)</li> <li>• CPU 226 (6ES7216-2*D23-0XB0)</li> </ul>	
Communication interfaces	SIMATIC S7 Bus, RS 232, TTY
Connection of remote displays (through TTY interface)	Weight value (gross, net)
Adjustment of scales settings	Using PC parameterization software SIWATOOL MS (RS 232)
Measuring properties	
<ul style="list-style-type: none"> <li>• Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K</li> </ul>	0.05 %
<ul style="list-style-type: none"> <li>• Internal resolution Data format of weight values</li> </ul>	65535 2 byte (fixed-point)
Number of measurements/second	50 or 30
Digital filter	0.05 - 5 Hz (in 7 steps), mean-value filter
Weighing functions	
<ul style="list-style-type: none"> <li>• Weight values</li> <li>• Limit values</li> <li>• Zero setting function</li> <li>• Tare function</li> <li>• Tare specification</li> </ul>	Gross, net 2 (min./max.) Per command Per command Per command
Load cells	Strain gages in 4-wire or 6-wire system
Load cell powering	
<ul style="list-style-type: none"> <li>• Supply voltage <math>U_s</math> (rated value)</li> <li>• Max. supply current</li> </ul>	6 V DC typ. ≤150 mA

SIWAREX MS	
Load cell powering (cont.)	
<ul style="list-style-type: none"> <li>• Permissible load impedance</li> </ul>	
- $R_{Lmin}$	> 40 Ω
- $R_{Lmax}$	< 4010 Ω
	With SIWAREX IS Ex interface or SIWAREX Pi:
- $R_{Lmin}$	> 87 Ω
- $R_{Lmax}$	< 4010 Ω
Load cell characteristic	1 mV/V ... 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-2,4 ... +26.4 mV
Max. distance of load cells	500 m
Intrinsically-safe load cell powering	
Connection to load cells in Ex zone 1	Optionally over SIWAREX IS Ex interface or SIWAREX Pi:
Ex approvals and safety	CE, ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
Supply voltage 24 V DC	
<ul style="list-style-type: none"> <li>• Rated voltage</li> <li>• Max. current consumption</li> </ul>	24 V DC 130 mA
Supply voltage 5 V DC (from CPU)	
<ul style="list-style-type: none"> <li>• Rated voltage</li> <li>• Max. current consumption</li> </ul>	5 V DC 145 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min}(IND)$ to $T_{max}(IND)$ (operating temperature)	
• Vertical installation	0 ... +55 °C
• Horizontal installation	0 ... +40 °C
EMC requirements according to	EN 61326, EN 45501 NAMUR NE21, Part 1

## SIMATIC S7-200

## Function modules

## SIWAREX MS

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Ordering Data	Order No.	Order No.
<b>SIWAREX MS</b> B7 Weighing electronics for scales in SIMATIC S7-200 for applications without obligation of verification	<b>7MH4 930-0AA01</b>	<b>SIWAREX JB junction box, stainless steel housing</b> 7MH4 710-1EA for connecting up to 4 load cells in parallel
<b>SIWAREX MS Manual</b> • available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing-technology">www.siemens.com/weighing-technology</a>		<b>Ex interface, type SIWAREX Pi</b> 7MH4 710-5AA With UL and FM approvals, but <b>without ATEX approval</b> for intrinsically safe connection of load cells, suitable for weighing modules SIWAREX U, CS, MS, FTA, FTC and M. Not approved for use in the EU.
<b>Configuration package SIWAREX MS on CD-ROM for STEP7 Micro/WIN, version 4.0 SP2 or higher</b> • Software for SIWATOOL MS scale adjustment (in a range of languages) • Manuals available on CD (in a range of languages) • Micro/WIN Library MicroScale for communication with SIWAREX MS	<b>7MH4 930-0AK01</b>	<b>Manual for Ex interface type SIWAREX Pi</b> C71000-T5974-C29 <b>Ex interface, type SIWAREX IS</b> With ATEX approval, but <b>without UL and FM approvals</b> 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.
<b>SIWAREX MS "Getting started"</b> Sample software show beginners how to program the scales. Free download on the Internet at: <a href="http://www.siemens.com/weighing-technology">www.siemens.com/weighing-technology</a>		• With short-circuit current < 199 mA DC <b>7MH4 710-5BA</b> • With short-circuit current < 137 mA DC <b>7MH4 710-5CA</b>
<b>SIWATOOL cable</b> from SIWAREX M, FTA, FTC, MS with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long • 5 m long	<b>7MH4 702-8CA</b> <b>7MH4 702-8CB</b>	<b>Cable (optional)</b> <b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath</b> 7MH4 702-8AG 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 JB's, for fixed laying, occasional bending permitted, 10.8 mm outer diameter, for ambient temperature -40 to +80 °C
<b>Shield clamps for shield - termination</b> Pack of 10; 1 item required for each shielded cable	<b>6ES5 728-8MA11</b>	<b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath</b> 7MH4 702-8AF 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 ... +80 °C
<b>Remote displays (option)</b> The digital remote displays can be connected directly to the SIWAREX MS through the TTY interface. The following remote display can be used: S102 Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999 Internet: <a href="http://www.siebert.de">http://www.siebert.de</a> Detailed information available from manufacturer.		<b>Cable LIYCY 4 x 2 x 0.25 mm<sup>2</sup></b> B7 <b>7MH4 407-8BD0</b> for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display
<b>Accessories</b> <b>SIWAREX JB junction box, aluminium housing</b> for connecting up to 4 load cells in parallel, and for connecting several junction boxes	<b>7MH4 710-1BA</b>	

B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200

## Function modules

### SIPLUS DCF 77 radio clock module

#### Overview



This module can be used to synchronize the real-time clock of the SIMATIC S7-200, S7-300 and S7-400 automation systems with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig.

The time is received by means of a DCF receiver (antenna with electronics) which is connected via two digital inputs on the SIMATIC and SIPLUS together with a software driver included in the scope of delivery (function block FB). The function blocks are available on the Internet for downloading.

<http://www.siemens.com/siplus> – Support – Tools and Downloads!

#### Technical specifications

##### Radio clock module SIPLUS DCF 77

Radio frequency	77,5 Hz
Power supply	DC 24 V (DC 20,4 ... 28, 8)
Power consumption, typ.	50 mA
Dimensions (W x H x D)	75 x 125 <sup>1)</sup> x 75

1) Additionally 25 mm (0.98 in) for heavy duty threaded joint and bending radius for cables

#### Ordering Data

#### Order No.

##### SIPLUS DCF 77 radio clock module

B7

**6AG1 057-1AA03-0AA0**

For synchronizing SIMATIC S7-200, S7-300 and S7-400 with the official time of the DCF 77 time signal transmitter of the Physikalisch-Technische Bundesanstalt Braunschweig

B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200

## Communication

### EM 241 modem

#### Overview



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

#### Technical specifications

6ES7 241-1AA22-0XA0	
<b>Supply voltages</b>	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
<b>Current consumption</b>	
from load voltage L+ (without load), max.	70 mA
from backplane bus DC 5 V, max.	80 mA; from expansion bus
<b>Current consumption/ power loss</b>	
Power loss, typ.	2,1 W
<b>Communication functions</b>	
Bus protocol/transmission protocol	PPI, Modbus
<b>Connection point</b>	
Telephone lines	RJ11 (4 cables, 6 contacts)
<b>Modem</b>	
Standards	Bell 103, Bell 212, V. 21, V. 22, V. 22 bis, V. 23c, V. 32, V. 32 to, V. 34 (preset)
Touch tone service	Yes
Pulse dialing	Yes
<b>Dimensions</b>	
Dimensions	
• Width	71,2 mm
• Height	80 mm
• Depth	62 mm
Weights	
• Weight, approx.	190 g

#### Ordering Data

#### Order No.

<b>Modem EM 241</b>	B7	<b>6ES7 241-1AA22-0XA0</b>
Analog modem for remote maintenance/remote diagnostics; CPU-to-CPU/PC communication, SMS/pager messaging		
<b>Grounding terminal</b>		<b>6ES5 728-8MA11</b>
10 items		
<b>S7-200 programmable controller, system manual</b>		
for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4		
German		<b>6ES7 298-8FA24-8AH0</b>
English		<b>6ES7 298-8FA24-8BH0</b>
French		<b>6ES7 298-8FA24-8CH0</b>
Spanish		<b>6ES7 298-8FA24-8DH0</b>
Italian		<b>6ES7 298-8FA24-8EH0</b>
Chinese		<b>6ES7 298-8FA24-8FH0</b>

B7: Subject to export regulations: AL: N and ECCN: EAR99H

### EM 277 PROFIBUS DP module

#### Overview



- For connecting S7-22x to PROFIBUS DP (as a slave) and MPI
- Simultaneous operation as MPI slave and DP slave is possible
- Transmission rate max. 12 Mbit/s
- Version 6ES7 2xx-xxx21-xxxx and higher can be used with CPU

#### Technical specifications

6ES7 277-0AA22-0XA0	
<b>Supply voltages</b>	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
<b>Current consumption</b>	
from backplane bus DC 5 V, max.	150 mA
from sensor current supply or external current supply (DC 24 V), max.	180 mA; 30 to 180 mA
<b>Current consumption/ power loss</b>	
Power loss, typ.	2.5 W
<b>Hardware configuration</b>	
Connectable nodes	TD 200 as of V2.0, OP, TP, PG/PC, S7-300/400, PROFIBUS DP master
<b>Communication functions</b>	
Bus protocol/transmission protocol	PROFIBUS DP (slave), MPI (slave)
Number of connections	
• MPI connections, max.	6
- MPI connections reserved for OP communication	1
- MPI connections reserved for PG communication	1
<b>interfaces</b>	
Number of RS 485 interfaces	1
DC 5 V	
• Output current, max.	90 mA

6ES7 277-0AA22-0XA0	
DC 24 V	
• Voltage range	20.4 to 28.8 V
• Output current, max.	120 mA
• Current limiting	0.7 to 2.4 A
<b>Connection point</b>	
pluggable I/O terminals	No
<b>PROFIBUS DP</b>	
Transmission speed, max.	12 MBit/s; 9.6 / 19.2 / 45.45 / 93.75 / 187.5 / 500 Kbit/s; 1 / 1.5 / 3 / 6 / 12 Mbit/s
Node addresses	0 to 99, adjustable
Cable length, max.	1 200 m; 100 to 1200 m, depending on transmission speed
Number of stations in network, max.	126; of which max. 99 EM 277
Number of stations per segment, max.	32
automatic detection of transmission speed	Yes
<b>Dimensions</b>	
Dimensions	
• Width	71.2 mm
• Height	80 mm
• Depth	62 mm
Weights	
• Weight, approx.	175 g

#### Ordering Data

**PROFIBUS DP  
EM 277 input module**  
for CPU 222/224/224 XP/226,  
for connecting to PROFIBUS DP  
(slave) and MPI

#### Order No.

**6ES7 277-0AA22-0XA0**

# SIMATIC S7-200

## Communication

### SIPLUS EM 277 PROFIBUS DP module

#### Overview



- For connecting S7-22x to PROFIBUS DP (as a slave) and MPI
- Simultaneous operation as MPI slave and DP slave is possible
- Transmission rate max. 12 Mbit/s
- Version 6ES7 2xx-xxx21-xxxx and higher can be used with CPU

PROFIBUS DP EM 277 module	
Order No.	6AG1 277-0AA22-2XA0
Order No. based on	6ES7 277-0AA22-0XA0
Ambient temperature range	-25 to +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible
Ambient conditions	Suitable for extraordinary medial load (e.g. by chloric and sulphuric atmospheres).
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1).	Yes
Approvals	CE, cUL
Technical data	The technical data are identical with the technical data of the based on modules.

Ordering Data	Order No.
<b>SIPLUS EM 277 PROFIBUS DP module</b>	B7 <b>6AG1 277-0AA22-2XA0</b>
(enhanced temperature range and medial exposure)	
for CPU 222/224/224 XP/226, for connecting to PROFIBUS DP (slave) and MPI	

B7: Subject to export regulations: AL: N and ECCN: EAR99H

### Overview



The CP 243-2 is the AS-Interface master for the innovated generation of SIMATIC S7-200. The communications processor (6GK1 243-2AX01-0XA0) supports the extended AS-Interface specification V2.1 and has the following functions:

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

### Technical specifications

<b>Order No.</b>	<b>6GK7 243-2AX01-0XA0</b>
<b>Product type description</b>	<b>CP 243-2</b>
<b>Interfaces</b>	
Version of electrical connection of the AS-Interface	Terminal connection
Supply voltage	
Supply voltage from backplane bus	5 V
Current consumption	
• from 5 V DC backplane bus, max.	220 mA
• from AS-Interface cable, max.	100 mA
<b>Effective power loss</b>	
Effective power loss	2 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• when installed vertically	
- during operation	0 ... 45 °C
• when installed horizontally	
- during operation	0 ... 55 °C

<b>Order No.</b>	<b>6GK7 243-2AX01-0XA0</b>
<b>Product type description</b>	<b>CP 243-2</b>
<b>Permitted ambient conditions</b> (continued)	
Ambient temperature during storage	-40 ... +70 °C
Ambient temperature during transport	-40 ... +70 °C
Maximum relative humidity at 25 °C during operation	95%
<b>Design, dimensions and weight</b>	
Module format	Expansion module in S7-200 design
Width	71 mm
Height	80 mm <sup>1)</sup>
Depth	62 mm
Net weight	250 g
Number of slots required	1
<b>Standards and specifications</b>	
Version of the AS-Interface specification	V 2.1
Bus cycle time of the AS-Interface	
• with 31 slaves	5 ms
• with 62 slaves	10 ms
<b>Performance data</b>	
Data volume	
• of the address area of the analog inputs as allocation in the PLC	16 byte
• of the address area of the analog outputs as allocation in the PLC	16 byte
• of the address area of the digital inputs as allocation in the PLC	1 byte
• of the address area of the digital outputs as allocation in the PLC	1 byte

1) Height +16 mm with holes for wall fixing

### Ordering Data

<b>Order No.</b>	<b>6GK7 243-2AX01-0XA0</b>
<b>CP 243-2 communications processor</b>	
for connection of the SIMATIC S7-200 to AS-Interface	
<b>Electronic manuals</b>	<b>6GK1 975-1AA00-3AA0</b>
Communication systems, protocols, products on CD-ROM, German/English Free download from the Internet at <a href="http://support.automation.siemens.com/WW/view/com/10805930/133300">http://support.automation.siemens.com/WW/view/com/10805930/133300</a>	

# SIMATIC S7-200

## Communication

### CP 243-1

#### Overview



ISO	TCP	PN	MRP	IT	IP-R	PG/OP	S7
	●					●	●

- Connection of S7-200 to Industrial Ethernet with
  - 10/100 Mbit/s
  - Half/full duplex
  - RJ 45 socket
  - TCP/IP
- Configuration, remote programming and service with STEP 7 Micro/WIN over Industrial Ethernet possible (program upload and program download, status)
- CPU/CPU communication over Industrial Ethernet possible (client + server, 8 S7 connections + 1 PG connection)
- An S7 OPC server (e.g. SOFTNET-S7 or S7-1613) allows PLC data to be further processed in PC applications
- Module replacement possible without PG

#### Technical specifications

Order No.	6GK7 243-1EX00-0XE0
Product type description	CP 243-1
<b>Transfer rate</b>	
Transmission rate at Interface 1	
• Minimum	10 Mbit/s
• Maximum	100 Mbit/s
<b>Interfaces</b>	
Electrical connection version	
• at Industrial Ethernet interface 1	1 x RJ45 (TP)
• for voltage supply	2-pin terminal strip

Order No.	6GK7 243-1EX00-0XE0
Product type description	CP 243-1
<b>Supply voltage</b>	
Type of supply voltage	DC
Supply voltage	24 V
• Relative symmetrical tolerance at 24 V DC	5%
<b>Current consumption</b>	
Current consumed	
• from backplane bus at 24 V DC typical	55 mA
• from external supply voltage at 24 V DC typical	60 mA
Effective power loss	1.75 W
<b>Permitted ambient conditions</b>	
Ambient temperature for vertical installation	
• during operation	0 ... +45 °C
Ambient temperature for horizontal installation	
• during operation	0 ... +55 °C
Ambient temperature during storage	-40 ... +70 °C
Ambient temperature during transport	-40 ... +70 °C
Maximum relative humidity at 25 °C during operation	95%
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-200, double width
• Width	71.2 mm
• Height	80 mm
• Depth	62 mm
Net weight	150 g
<b>Performance data</b>	
<b>S7 communication</b>	
Number of possible connections for S7 communication	
• Maximum	8
• for PG connections, maximum	1
<b>Configuration</b>	
Configuration software for full scope of functions from STEP 7-Micro/WIN V3.2 SP1	Yes



Ordering Data	Order No.	Order No.
<b>CP 243-1 communications processor</b> for connection of SIMATIC S7-200 to Industrial Ethernet; for S7 communication, PG communication with electronic manual on CD-ROM, German, English, French, Italian, Spanish	B3 <b>6GK7 243-1EX00-0XE0</b>	
<b>SOFTNET Edition 2007 for Industrial Ethernet</b> Software for S7 and open communication, incl. OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2; Windows 2003 Server SP1, R2, SP2; Windows Vista Business/Ultimate; German/English		<b>S7-1613 Edition 2007</b> Software for S7 and open communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2; Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; for CP 1613/CP 1613 A2/CP 1623; German/English
<b>SOFTNET-S7 Edition 2007 for Industrial Ethernet</b> up to 64 connections		<ul style="list-style-type: none"> <li>• Single license for 1 installation B3 <b>6GK1 716-1CB70-3AA0</b></li> <li>• Software Update Service for 1 year, with automatic extension; requirement: Current software version B3 <b>6GK1 716-1CB00-3AL0</b></li> <li>• Upgrade S7-1613 from V6.4 to 2007 Edition B3 <b>6GK1 716-1CB00-3AE0</b></li> <li>• Upgrade S7-1613 from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition B3 <b>6GK1 716-1CB00-3AE1</b></li> </ul>
<b>SOFTNET-S7 Lean Edition 2007 for Industrial Ethernet</b> up to 8 connections		<b>STEP 7-Micro/WIN V4 programming software</b> <i>Target system:</i> All CPUs of the SIMATIC S7-200 <i>Prerequisite:</i> Windows 2000/XP on PG or PC <i>Type of delivery:</i> German, English, French, Spanish, Italian, Chinese; with online documentation
<ul style="list-style-type: none"> <li>• Single license for 1 installation B3 <b>6GK1 704-1CW70-3AA0</b></li> <li>• Software Update Service for 1 year, with automatic extension; requirement: Current software version B3 <b>6GK1 704-1CW00-3AL0</b></li> <li>• Upgrade from V6.4 to 2007 edition B3 <b>6GK1 704-1CW00-3AE0</b></li> <li>• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition B3 <b>6GK1 704-1CW00-3AE1</b></li> </ul>		<ul style="list-style-type: none"> <li>• Single license B8 <b>6ES7 810-2CC03-0YX0</b></li> <li>• Upgrade Single License<sup>1)</sup> B8 <b>6ES7 810-2CC03-0YX3</b></li> </ul>
<ul style="list-style-type: none"> <li>• Single license for 1 installation B3 <b>6GK1 704-1LW70-3AA0</b></li> <li>• Software Update Service for 1 year, with automatic extension; requirement: Current software version B3 <b>6GK1 704-1LW00-3AL0</b></li> <li>• Upgrade from V6.4 to 2007 Edition B3 <b>6GK1 704-1LW00-3AE0</b></li> <li>• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition B3 <b>6GK1 704-1LW00-3AE1</b></li> </ul>		<b>IE FC TP Standard Cable GP 2x2</b> <b>6XV1 840-2AH10</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>FO Standard Cable GP (50/125)</b> <b>6XV1 873-2A</b> Standard cable, splittable, UL approval, sold by the meter
		<b>SCALANCE X204-2 Industrial Ethernet switch</b> <b>6GK5 204-2BB10-2AA3</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 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
		<b>IE FC RJ45 Plug 180</b> 180° cable outlet
		<ul style="list-style-type: none"> <li>• 1 unit <b>6GK1 901-1BB10-2AA0</b></li> <li>• 10 units <b>6GK1 901-1BB10-2AB0</b></li> <li>• 50 units <b>6GK1 901-1BB10-2AE0</b></li> </ul>

B3: Subject to export regulations: AL: N and ECCN: 5D992B1  
 B8: Subject to export regulations: AL: N and ECCN: EAR99S

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

# SIMATIC S7-200

## Communication

### CP 243-1 IT

#### Overview



ISO	TCP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

- Connection of S7-200 to Industrial Ethernet with
  - 10/100 Mbit/s
  - Half/full duplex
  - RJ 45 socket
  - TCP/IP
- Configuration, remote programming and service with STEP 7 Micro/WIN over Industrial Ethernet possible (program upload and program download, status)
- CPU/CPU communication over Industrial Ethernet possible (client + server, 8 S7 connections + 1 PG connection)
- IT communication
  - Web function
  - E-mail function
  - FTP client function for program-controlled data communication (e.g. DOS, UNIX, Linux, embedded systems)
- FTP server with 8 MB memory
- An S7 OPC server (e.g. SOFTNET-S7 or S7-1613) allows PLC data to be further processed in PC applications

#### Technical specifications

Order No.	6GK7 243-1GX00-0XE0
Product type description	CP 243-1 IT
<b>Transfer rate</b>	
Transmission rate at Interface 1	
• Minimum	10 Mbit/s
• Maximum	100 Mbit/s
<b>Interfaces</b>	
Electrical connection version	
• at Industrial Ethernet interface 1	1 x RJ45 (TP)
• for voltage supply	1 x 2-pin terminal block
<b>Supply voltage</b>	
Type of supply voltage	DC
Supply voltage	24 V
Relative symmetrical tolerance at 24 V DC	5%

Order No.	6GK7 243-1GX00-0XE0
Product type description	CP 243-1 IT
<b>Current consumption</b>	
Current consumed	
• from backplane bus at 24 V DC typical	55 mA
• from external supply voltage at 24 V DC typical	60 mA
Effective power loss	1.75 W
<b>Permitted ambient conditions</b>	
Ambient temperature for vertical installation	
• during operation	0 ... +45 °C
Ambient temperature for horizontal installation	
• during operation	0 ... +55 °C
Ambient temperature during storage	-40 ... +70 °C
Ambient temperature during transport	-40 ... +70 °C
Maximum relative humidity at 25 °C during operation	95%
<b>Design, dimensions and weight</b>	
Module format	Compact module S7-200, doublewidth
• Width	71.2 mm
• Height	80 mm
• Depth	62 mm
Net weight	150 g
<b>Performance data</b>	
<b>S7 communication</b>	
Number of possible connections for S7 communication	
• Maximum	8
• for PG connections, maximum	1
<b>IT functions</b>	
Number of possible connections	
• as client by means of FTP, max.	1
• as server by means of HTTP, max.	4
• to an e-mail server as e-mail client, max.	1
Number of e-mails with 1024 characters of the e-mail client, max.	32
Number of access authorizations of the access protection	8
Memory capacity of the user memory as FLASH memory file system	8 MB
Number of possible write cycles of the flash memory cells	1000000
<b>Configuration</b>	
Configuration software for full scope of functions from STEP 7-Micro/WIN V3.2 SP3	Yes

Ordering Data	Order No.	Order No.
<b>CP 243-1 IT communications processor</b> for connection of SIMATIC S7-200 to Industrial Ethernet; for S7 communication, PG communication, E-mail and WWW server; with electronic manual on CD-ROM German, English, French, Italian, Spanish	B3 <b>6GK7 243-1GX00-0XE0</b>	
<b>SOFTNET Edition 2007 for Industrial Ethernet</b> Software for S7 and open communication, incl. OPC server, PG/OP communication and NCM PC, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2, Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; German/English		<b>S7-1613 Edition 2007</b> Software for S7 and open communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, runtime software, software and electronic manual on CD-ROM, license key on USB stick, Class A, for 32-bit Windows XP Professional SP1, 2; Windows 2003 Server SP1, R2, SP2, Windows Vista Business/Ultimate; for CP 1613/CP 1613 A2/CP 1623; German/English
<b>SOFTNET-S7 Edition 2007 for Industrial Ethernet</b> up to 64 connections		<ul style="list-style-type: none"> <li>• Single license for 1 installation B3 <b>6GK1 716-1CB70-3AA0</b></li> <li>• Software Update Service for 1 year, with automatic extension; requirement: Current software version B3 <b>6GK1 716-1CB00-3AL0</b></li> <li>• Upgrade S7-1613 from V6.4 to 2007 Edition B3 <b>6GK1 716-1CB00-3AE0</b></li> <li>• Upgrade S7-1613 from V6.0, V6.1, V6.2 or V6.3 to S7-1613 Edition 2007 B3 <b>6GK1 716-1CB00-3AE1</b></li> </ul>
<ul style="list-style-type: none"> <li>• Single license for 1 installation B3 <b>6GK1 704-1CW70-3AA0</b></li> <li>• Software Update Service for 1 year, with automatic extension; requirement: Current software version B3 <b>6GK1 704-1CW00-3AL0</b></li> <li>• Upgrade from V6.4 to 2007 edition B3 <b>6GK1 704-1CW00-3AE0</b></li> <li>• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition B3 <b>6GK1 704-1CW00-3AE1</b></li> </ul>		<b>STEP 7-Micro/WIN V4 programming software</b> <i>Target system:</i> All CPUs of the SIMATIC S7-200 <i>Prerequisite:</i> Windows 2000/XP on PG or PC <i>Type of delivery:</i> German, English, French, Spanish, Italian, Chinese; with online documentation
<b>SOFTNET-S7 Lean Edition 2007 for Industrial Ethernet</b> up to 8 connections		<ul style="list-style-type: none"> <li>• Single license B8 <b>6ES7 810-2CC03-0YX0</b></li> <li>• Upgrade Single License<sup>1)</sup> B8 <b>6ES7 810-2CC03-0YX3</b></li> </ul>
<ul style="list-style-type: none"> <li>• Single license for 1 installation B3 <b>6GK1 704-1LW70-3AA0</b></li> <li>• Software Update Service for 1 year, with automatic extension; requirement: Current software version B3 <b>6GK1 704-1LW00-3AL0</b></li> <li>• Upgrade from V6.4 to 2007 Edition B3 <b>6GK1 704-1LW00-3AE0</b></li> <li>• Upgrade from V6.0, V6.1, V6.2 or V6.3 to 2007 Edition B3 <b>6GK1 704-1LW00-3AE1</b></li> </ul>		<b>IE FC TP Standard Cable GP 2x2</b> <b>6XV1 840-2AH10</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>FO Standard Cable GP (50/125)</b> <b>6XV1 873-2A</b> Standard cable, splittable, UL approval, sold by the meter
		<b>SCALANCE X204-2 Industrial Ethernet switch</b> <b>6GK5 204-2BB10-2AA3</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 Mbit/s RJ45 ports and two FO ports
		<b>IE FC RJ45 Plugs</b> RJ45 plug connector for Industrial Ethernet with a rugged metal housing 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 <b>6GK1 901-1BB10-2AA0</b></li> <li>• 10 units <b>6GK1 901-1BB10-2AB0</b></li> <li>• 50 units <b>6GK1 901-1BB10-2AE0</b></li> </ul>

B3: Subject to export regulations: AL: N and ECCN: 5D992B1  
 B8: Subject to export regulations: AL: N and ECCN: EAR99S

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

# SIMATIC S7-200

## Communication

### GSM/GPRS MD720-3 modem

#### Overview



- SINAUT mobile radio modem with RS232 interface
  - DIN rail mounting
  - 24 V DC power supply
  - Supports the GSM services CSD <sup>\*)</sup>, SMS and GPRS
  - Use with SINAUT MICRO:  
Data transmission via GPRS; switchable to CSD for remote maintenance (incoming call only)
  - Use with SINAUT ST7:  
Data transmission via CSD, transmission of SMS
- <sup>\*)</sup> CSD – **C**ircuit **S**witched **D**ata (data transmission via GSM dialup connection)

#### Technical specifications

	MD720-3
<b>Transfer rate</b>	
• RS232	300 bit/s to 57,600 bit/s
• GSM data calls	CSD 9,600 bit/s
• GPRS	
- Up to 2 uplinks	13.4 Kbit/s to 27 Kbit/s gross upload (modem to Internet); net approx. 30 % lower
- Up to 4 downlinks	40 Kbit/s to 54 Kbit/s gross download (Internet to modem); net is approx. 30 % lower
<b>Interfaces</b>	
• RS232	1 x 9-pin Sub-D socket
• Antenna connection	1 x SMA antenna socket (50 Ohm)
<b>Frequency ranges</b>	850, 900, 1800, 1900 MHz
<b>Transmitted output power</b>	2 W at 850, 900 MHz 1 W at 1800, 1900 MHz
<b>Current consumption</b>	
Send mode	
• at 12 V	430 mA
• at 24 V	140 mA
Receive mode	
• at 12 V	90 mA
• at 24 V	50 mA

	MD720-3
<b>Supply voltage</b>	12 ... 30 V DC
<b>Power loss</b>	typ. 5 W
<b>Permissible ambient conditions</b>	
• Operating temperature	- 20 °C ... +60 °C
• Transport/storage temperature	- 25 °C ... +85 °C
• Relative humidity	Max. 95 % at +25 °C
<b>Design</b>	
• Dimensions (W x H x D) in mm	22.5 x 99 x 114
• Weight	Approx. 150 g
• Assembly	Standard rail
<b>Degree of protection</b>	IP40
<b>Configuration</b>	AT commands using S7-200 program blocks; MC45-compatible AT commands for use with SINAUT ST7 modules
<b>National approvals</b>	Current approvals can be found in the Internet at <a href="http://www.siemens.com/simatic-net/ik-info">http://www.siemens.com/simatic-net/ik-info</a>

Ordering Data	Order No.	Order No.
<b>GSM/GPRS MD720-3 modem</b> GPRS modem for IP-based data transmission over GSM networks, quad band, AT command interface, automatic establishment of GPRS connection, switchable to CSD mode, RS232; manual on CD-ROM in German, English, Chinese, Russian	<b>6NH9 720-3AA00</b>	<b>ANT794-4MR antenna</b> Quad band antenna, omnidirectional with 5 m cable
<b>Accessories</b> <b>SINAUT MICRO SC</b> Single license for one installation; OPC server for GPRS communication with S7-200; connection management with 8, 64 or 256 remote stations; routing for connections between S7-200 stations; connection monitoring; German and English GUI; for Windows XP Professional SP 2 and higher, Windows 2003 Server SP 1, Windows 2000 Professional/Server SP 4; manual on CD-ROM in German, English, Chinese, Russian		<b>SIMATIC S7-200 PPI modem cable</b> B7 For connecting the S7-200 to the GSM/GPRS modem SINAUT MD720-3
<ul style="list-style-type: none"> <li>• <b>SINAUT MICRO SC8</b> B8 <b>6NH9 910-0AA10-0AA3</b>                Connection management for 8 S7-200 stations;</li> <li>• <b>SINAUT MICRO SC64</b> B8 <b>6NH9 910-0AA10-0AA6</b>                Connection management for 64 S7-200 stations;</li> <li>• <b>SINAUT MICRO SC256</b> B8 <b>6NH9 910-0AA10-0AA8</b>                Connection management for 256 S7-200 stations;</li> </ul>		<b>Connecting cable</b> For connecting a TIM3V-IE/TIM4 (RS232) with the GSM modem MD720-3 (access to GSM network). Also suitable for third-party modems or radio equipment with RS232 standard; cable length 2.5 m.

B7: Subject to export regulations: AL: N and ECCN: EAR99H

B8: Subject to export regulations: AL: N and ECCN: EAR99S

# SIMATIC S7-200

## Communication

### ANT794-4MR GSM/GPRS antenna

#### Overview



- Omnidirectional antenna for use in GSM/GPRS networks
- Remote antenna for indoors/outdoors
- Suitable for quad band
- Complete with cable and mounting bracket for direct connection to SINAUT GPRS modems

#### Technical specifications

ANT794-4MR	
Mobile telephone networks	GSM / GPRS
Frequencies	850 MHz, 900 MHz, 1800 MHz, 1900 MHz, 2200 MHz
Characteristic	Omnidirectional
Antenna amplification	0 dB
SWR	< 2.0
Max. power	20 W
Polarity	Linear vertical
Connectors	SMA
Length of antenna cable	5 m
Perm. ambient conditions	
• Operating temperature	- 40 °C ... +70 °C
• Transport/storage temperature	- 40 °C ... +70 °C
• Relative humidity	100 %
Design	
• Dimensions (D x H) in mm	25 x 193
• Weight	380 g (incl. packaging)
• Assembly	Using supplied bracket
Degree of protection	IP65
Outer material	Hard PVC UV-resistance

#### Ordering Data

#### Order No.

##### GSM/GPRS antenna ANT794-4MR antenna

6NH9 860-1AA00

GSM/GPRS quad band antenna; weather-resistant for indoor/outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs

#### Accessories

##### GSM/GPRS modem MD720-3

6NH9 720-3AA00

GPRS modem for IP-based data transmission over GSM networks, quad band, AT command interface, automatic establishment of GPRS connection, switchable to CSD mode, RS232, including gender changer for RS232/PPI adapter; manual on CD-ROM in German, English, Chinese, Russian

##### EGPRS router MD741-1

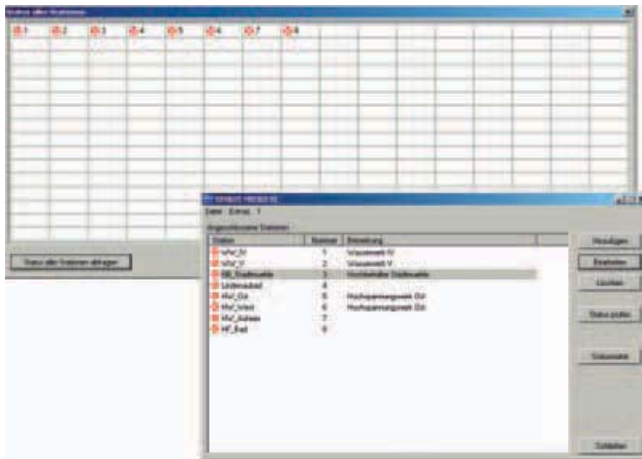
C3

6NH9 741-1AA00

For wireless IP communication by industrial Ethernet-based programmable controllers via GSM mobile radio networks; integrated firewall and VPN router (IPsec); quad band GSM; GPRS Multislot Class 12

C3: Subject to export regulations: AL: 5A002A1A2 and ECCN: 5A002ENC3

### Overview



- Software package for PC and SIMATIC S7-200, comprising:
  - *Software for the PC:*
    - OPC server,
    - connection manager
  - *Software for S7-200:*
    - PLC block library
- OPC server for GPRS linking of SIMATIC S7-200 stations to a control center
- Permanent, bidirectional and wireless online connection to the S7-200 via GPRS
- GPRS communication between S7-200 stations by means of routing function
- Clear monitoring of GPRS station connections
- Low GPRS mobile radio costs due to optimized communication with effective frame design
- Encrypted transmission for protection against data manipulation and tapping

### Technical specifications

SINAUT MICRO SC	
Controls that are supported	S7-200 CPU 224 or higher (block library included in scope of supply)
Number of stations that can be used	8, 64 or 256 controllers
Interfaces to the OPC Client	<ul style="list-style-type: none"> <li>• DCOM protocol</li> <li>• OPC "data access interface V2.05"</li> <li>• Synchronous and asynchronous reading of variables</li> </ul>
Interfaces and functions for the SIMATIC S7-200	<ul style="list-style-type: none"> <li>• Writing of variables in the SIMATIC S7 in the case of values changes to OPC variables</li> <li>• Transfer of SIMATIC S7 data to OPC variables (for event-driven communication from the SIMATIC S7)</li> <li>• Activatable cyclic reading of variables; adjustable time interval</li> <li>• Monitoring of connected SIMATIC S7 with time-of-day synchronization</li> <li>• Routing of data packets between connected SIMATIC S7-200 stations</li> <li>• Protocol optimized for GPRS; tunnel configuration from GPRS modem</li> <li>• Via Internet access as server with public IP address (recommendation: fixed public Internet address)</li> </ul>
Operating systems	Microsoft Windows XP Professional from SP2; Microsoft Windows 2003 Server SP1; Microsoft Windows 2000 Professional/Server SP4
Diagnostics	Integral OPC client for connection monitoring
Configuration	Using integral configuration tool

### Ordering Data

SINAUT MICRO SC		Order No.
Single license for one installation; OPC server for GPRS communication with S7-200; connection management for as many as 8, 64 or 256 S7-200 stations; routing for connections between S7-200 stations; connection monitoring; German and English user interface; for Windows XP Professional SP2 or higher, Windows 2003 Server Standard Edition SP1, Windows 2000 Professional/Server SP4; electronic manual in German, English, Chinese, Russian		
• <b>SINAUT MICRO SC8</b> Connection management for 8 S7-200 stations;	B8	<b>6NH9 910-0AA10-0AA3</b>
• <b>SINAUT MICRO SC64</b> Connection management for 64 S7-200 stations;	B8	<b>6NH9 910-0AA10-0AA6</b>
• <b>SINAUT MICRO SC256</b> Connection management for 256 S7-200 stations;	B8	<b>6NH9 910-0AA10-0AA8</b>

### Accessories

<b>GSM/GPRS modem MD720-3</b> GPRS modem for IP-based data transmission over GSM networks		<b>6NH9 720-3AA00</b>
<b>ANT794-4MR antenna</b> Quad band antenna, omnidirectional with 5 m cable		<b>6NH9 860-1AA00</b>
<b>Alarm Control Center Micro Edition</b> Remote alarm tool for SINAUT MICRO SC for up to four receivers, message dispatch as acknowledgeable SMS (incl. GSM modem & accessories, without SIM card)	B3	<b>9AE4 310-3BM01</b>

B3: Subject to export regulations: AL: N and ECCN: 5D992B1

B8: Subject to export regulations: AL: N and ECCN: EAR99S



# SIMATIC S7-200

## Power supplies

### Power supplies

#### Overview

##### *SITOP modular*



The controlled load power supply for the SIMATIC S7-200:

- Harmonized in design and functionality with trouble-free integration in PLC network.
- For reliable 24 V DC; 3.5 A power to controllers, encoders and sensors.
- Flexible, whether in industrial or house-hold networks.

##### *SITOP smart*



##### *Slimline universal power supplies*

Slimline dimensions, strong performance. This new range of power supplies requires approximately a third less width space on the top-hat rail than its predecessor and features excellent overload behavior. Numerous certifications permit universal use around the world.

##### *LOGO!Power*



LOGO!Power supplies are switched mode power supplies that match the functionality and design of the LOGO! logic modules optimally.



### Technical specifications SITOP power 3,5 A

Type	3.5 A
<b>Order No.</b>	6EP1 332-1SH31 <sup>1)</sup>
<b>Input</b>	Single-phase AC
Rated voltage $V_{in \text{ rated}}$	<b>120/230 V AC</b> Set via wire jumper
Voltage range	93 ... 132 V/187 ... 264 V AC
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}$ , 1.3 ms
Mains buffering $I_{out \text{ rated}}$	> 20 ms at $V_{in} = 187 \text{ V}$
Rated line frequency; rated line-frequency range	50/60 Hz; 47 ... 63 Hz
Rated current $I_{n \text{ rated}}$	1.65/0.95 A
Switch-on current limit (+25 °C)	< 33 A, < 3 ms ( $V_{in} = 230 \text{ V}$ )
$I^2 t$	< 1.0 A <sup>2</sup> s
Built-in-line-side fuse	T 2.5 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in the mains power input	Tc
<b>Output</b>	Controlled, isolated DC voltage
Rated voltage $V_{out \text{ rated}}$	<b>24 V DC</b>
Total tolerance	$\pm 5 \%$ (typ. $\pm 2 \%$ )
• Static mains compensation	Approx. $\pm 0.1 \%$
• Static load smoothing	Approx. $\pm 0.2 \%$
Residual ripple	< 150 mV <sub>pp</sub> (typ. 30 mV <sub>pp</sub> )
Spikes (bandwidth: 20 MHz)	< 240 mV <sub>pp</sub> (typ. 110 mV <sub>pp</sub> )
Adjustment range	-
Status display	-
Response on activation/deactivation	v
Startup delay/voltage rise	< 1 s/typ. 80 ms
Rated current $I_{out \text{ rated}}$	<b>3.5 A</b>
Current range	
• Up to +45 °C	0 ... 3.5 A
• Up to +60 °C	0 ... 3.5 A
Dynamic overcurrent on	
• Power-up on short circuit	Typ. 5 A for 100 ms
• Short-circuit during operation	Typ. 5 A for 100 ms
Parallel switching for enhanced performance	Yes, up to 5 units
<b>Efficiency</b>	
Efficiency at $V_{out \text{ rated}}$ , $I_{out \text{ rated}}$	Approx. 84 %
Power loss at $V_{out \text{ rated}}$ , $I_{out \text{ rated}}$	Approx. 16 W
<b>Closed-loop control</b>	
Dynamic mains compensation ( $V_{in \text{ rated}} \pm 15 \%$ )	Typ. $\pm 0.3 \%$ $V_{out}$
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %)	Typ. $\pm 3 \%$ $V_{out}$
Load-step settling time	
• 50 to 100 %	< 5 ms
• 100 to 50 %	< 5 ms

Type	3.5 A
<b>Protection and monitoring</b>	
Output overvoltage protection	Yes, according to EN 60950
Current limit	3.8 A
Short-circuit protection	Constant current characteristic up to typ. 14 V, electronic shutdown below that, automatic restart
Sustained short-circuit current rms value	< 4 A
Overload/short-circuit indicator	-
<b>Safety</b>	
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage $V_{out}$ to EN 60950
Protective class	Class I
Leakage current	< 3.5 mA
German Technical Inspectorate approval	Yes
CE marking	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	-
Marine approval	-
Degree of protection (EN 60529)	IP20
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Supply-harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature range	0 ... +60 °C with natural convection
Transport/storage temperature range	-25 ... +85 °C
Humidity class	Climatic class 3K3 to EN 60721, no condensation
<b>Mechanics</b>	
Connections	
• Supply input L, N, PE	One screw terminal each for 0.5 ... 1 mm <sup>2</sup> finely stranded, 0.5 ... 1.5 mm <sup>2</sup> single-core
• Output +	1 screw terminal for 0.5 ... 1 mm <sup>2</sup>
• Output -	2 screw terminals for 0.5 ... 1 mm <sup>2</sup>
Dimensions (W x H x D) in mm	160 x 80 x 62
Weight, approx.	0,5 kg
Installation	Snaps onto DIN rail EN 60715 35x7,5/15, wall installation
<b>Accessories</b>	Mounting bracket

1) SIPLUS module 6AG1 203-1SH31-2AA0 for extended temperature range from -25 to +70 °C and use under medial load (e.g. chlorine-sulphur atmosphere).

# SIMATIC S7-200

## Power supplies

### Power supplies

#### Technical specifications LOGO!Power 4 A

Type	24 V/4 A
<b>Order number</b>	<b>6EP1 332-1SH51</b>
<b>Input</b>	Single-phase AC
Rated voltage $U_{inrated}$	<b>100 V - 240 V AC</b> wide-range input
Voltage range	85 V to 264 V AC
Overvoltage strength	$2.3 \times U_{inrated}/1.3$ ms
Line buffering at $I_{out rated}$	> 40 ms at $U_{in} = 187$ V
Rated line frequency, rated line-frequency range	50/60 Hz; 47 Hz to 63 Hz
Rated current $I_{inrated}$	1,95-0,97 A
Switch-on current limit (+25 °C)	< 30 A
$I^2t$	< 2.5 A <sup>2</sup> s
Built-in line-side fuse	Internal
Recommended miniature circuit breaker (IEC 898) in the supply feeder	At and above 16 A, B characteristic or at and above 10 A, C characteristic
<b>Output</b>	Controlled, isolated DC voltage
Rated voltage $U_{outrated}$	<b>24 V DC</b>
Total tolerance, static	±3 %
• Static line smoothing	Approx. 0.1 %
• Static load smoothing	Approx. 1.5 %
Ripple content (clock frequency approx. 90 kHz)	< 200 mV <sub>pp</sub>
Spikes (bandwidth approx. 20 MHz)	< 300 mV <sub>pp</sub>
Adjustment range	22.2 V to 26.4 V
Operation indicator	Green LED for output voltage OK
Response on activation/deactivation	No overshoot of $U_{out}$ (soft start)
Startup delay/voltage rise	< 0.5 s/typ. 35 ms
Rated current $I_{outrated}$	<b>4 A</b>
Current range up to +55 °C	0 A to 4 A
Parallel switching for enhanced performance	Yes
<b>Efficiency</b>	
Efficiency at $U_{outrated}$ , $I_{out rated}$	Typically 89 %
Heat loss at $U_{outrated}$ , $I_{out rated}$	Typically 12 W
<b>Control</b>	
Dynamic line smoothing ( $U_{in rated} \pm 15$ %)	< 0,2 % $U_a$
Dynamic load smoothing ( $I_{out}$ : 10/90/10 %)	±1.5 % $U_{out}$
Load-step settling time	
• 10 at 90 %	Typically 20 ms
• 90 at 10 %	Typically 20 ms

Type	24 V/4 A
<b>Order number</b>	<b>6EP1 332-1SH51</b>
<b>Protection and monitoring</b>	
Current limit	Typically 4.7 A
Short-circuit protection	Constant-current characteristic
Sustained-short-circuit-current rms value	< 10 A
Overload/short-circuit indicator	-
<b>Security</b>	
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage $U_{out}$ to EN 60950 and EN 50178
Protection class	Class II (without protective conductor)
CE marking	Yes
UL/cUL (CSA) approval	Yes, cULus-listed (UL 508, CSA 22.2), file E197259; cURus-recognized (UL 60950, CSA 22.2), file E151273
FM approval	Yes, Class I Div. 2, Group A, B, C, D T4
Marine Type Approval	Yes, GL, ABS
Degree of protection (EN 60529)	IP20
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Supply-harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature range	-20 °C to +55 °C with natural convection
Transport/storage temperature range	-40 °C to +70 °C
Humidity class	Climate class 3K3 to EN 60721, no condensation
<b>Mechanical system</b>	
Supply-input connections L1, N	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm <sup>2</sup>
Connections	
• Output +	Per 2 screw-type terminals for 0.5 mm to 2.5 mm <sup>2</sup>
• Output -	
Dimensions (W x H x D) in mm	90 x 90 x 55
Weight	Approx. 0.34 kg
Mounting	Snaps onto DIN rail DIN EN 50022-35x15/7.5

### Technical specifications SITOP smart

Power supply, type	2.5 A
Order No.	6EP1 332-2BA10
<b>Input</b>	Single-phase AC
Rated voltage $V_{in \text{ rated}}$	<b>120/230 V AC</b> set by means of selector switch
Voltage range	85 ... 132 V/170 ... 264 V AC
Overvoltage resistance	$2.3 \times V_{in \text{ rated}}$ , 1.3 ms
Mains buffering at $I_{out \text{ rated}}$	> 20 ms at $V_{in} = 93/187 \text{ V}$
Rated line frequency; rated line-frequency range	50/60 Hz; 47 ... 63 Hz
Rated current $I_{in \text{ rated}}$	1.1/0.65 A
Switch-on current limit (+25°C)	< 27 A, typ. 3 ms
$I^2 t$	< 0.3 A <sup>2</sup> s
Built-in line-side fuse	T 2 A/250 V (non accessible)
Recommended miniature circuit breaker (IEC 898) in the mains power input	From 3 A, C characteristic
<b>Output</b>	Controlled, isolated DC voltage
Rated voltage $V_{out \text{ rated}}$	<b>24 V DC</b>
Total tolerance	±3 %
• Static mains compensation	Approx. 0.1 %
• Static load smoothing	Approx. 0.5 %
Residual ripple	< 150 mV <sub>pp</sub> (typ. 10mV <sub>pp</sub> )
Spikes (bandwidth: 20 MHz)	< 240 mV <sub>pp</sub> (typ. 50mV <sub>pp</sub> )
Adjustment range	22.8 ... 28.0 V
Status display	Green LED for 24 V OK
Response on activation/deactivation	Overshoot of $V_{out}$ approx. 4 %
Startup delay/voltage rise	< 0.1 s at 230 V AC/typ. 50 ms
Rated current $I_{out \text{ rated}}$	<b>2.5 A</b>
Current range	
• Up to +45°C	0 ... 3 A
• Up to +60°C	0 ... 2.5 A
Dynamic overcurrent on	
• Power-up on short-circuit	Typ. 7 A for 100 ms
• Short-circuit during operation	Typ. 7 A for 200 ms
Parallel switching for enhanced performance	Yes, 2 units
<b>Efficiency</b>	
Efficiency at $V_{out \text{ rated}}$ , $I_{out \text{ rated}}$	Approx. 85 %
Power loss at $V_{out \text{ rated}}$ , $I_{out \text{ rated}}$	Approx. 9 W
<b>Closed-loop control</b>	
Dynamic mains compensation ( $V_{in \text{ rated}} \pm 15 \%$ )	Typ. ±0.3 % $V_{out}$
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %)	Typ. ±1 % $V_{out}$
Load-step settling time	
• 50 at 100 %	Typ. 0.2 ms
• 100 at 50 %	Typ. 0.2 ms

Power supply, type	2.5 A
Order No.	6EP1 332-2BA10
<b>Protection and monitoring</b>	
Output overvoltage protection	< 33 V
Current limit	Typ. 3.2 ... 3.4 A, overload capability 150 % $I_{out \text{ rated}}$ ... 5 s/min
Short-circuit protection	Constant-current characteristic
Sustained short-circuit current rms value	Approx. 5 A
Overload/short-circuit indicator	-
<b>Safety</b>	
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage $V_{out}$ to EN 60950 and EN 50178
Protection class	Class I I
Leakage current	< 3.5 mA (typ. 0.4 mA)
German Technical Inspectorate approval	Notified Body (CB Scheme)
CE marking	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 14), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
Explosion protection	ATEX EX II 3G EEx nA II T4 U; UL 1604
Marine approval	GL
Degree of protection (EN 60 529)	IP20
<b>EMC</b>	
Emitted interference	EN 55022, Class B
Supply-harmonics limitation	Not applicable
Noise immunity	EN 61000-6-2
<b>Operating data</b>	
Ambient temperature range	0 ... +60 °C with natural convection
Transport/storage temperature range	-40 ... +85 °C
Humidity class	Climate class 3K3 to EN 60721, no condensation
<b>Mechanics</b>	
Connections	
• Supply input L, N, PE	One screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely-stranded
• Output +	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>
• Output -	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	32.5 x 125 x 125
Weight, approx.	0.32 kg
Installation	Snaps onto DIN rail EN 60715-35x7,5/15
<b>Accessories</b>	-

# SIMATIC S7-200

## Power supplies

### Power supplies

#### Technical specifications SITOP smart (continued)

Power supply, type	5 A	5 A
<b>Order No.</b>	<b>6EP1 333-2AA01</b>	<b>6EP1 333-2BA01</b>
<b>Input</b>	Single-phase AC	Single-phase AC
Rated voltage $V_{in rated}$	<b>120/230 V AC</b> set by means of selector switch on device	<b>120/230 V AC</b> set by means of selector switch on device
Voltage range	85 ... 132 V/170 ... 264 V AC	85 ... 132 V/170 ... 264 V AC
Overvoltage resistance	$2.3 \times V_{in rated}$ , 1.3 ms	$2.3 \times V_{in rated}$ , 1.3 ms
Mains buffering at $I_{out rated}$	> 20 ms at $V_{in} = 93/187$ V	> 20 ms at $V_{in} = 93/187$ V
Rated line frequency; rated-line-frequency range	50/60 Hz; 47 ... 63 Hz	50/60 Hz; 47 ... 63 Hz
Rated current $I_{in rated}$	2.1/1.15 A	2.1/1.15 A
Switch-on current limit (+25 °C)	< 32 A, typ. 3 ms	< 32 A, typ. 3 ms
$I^2 t$	< 0.8 A <sup>2</sup> s	< 0.8 A <sup>2</sup> s
Built-in line-side fuse	T 3.15 A/250 V (not accessible)	T 3.15 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in mains power input	From 6 A, Characteristic C	From 6 A, Characteristic C
<b>Output</b>	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out rated}$	<b>24 V DC</b>	<b>24 V DC</b>
Total tolerance	±3 %	±3 %
• Static mains compensation	Approx. 0.1 %	Approx. 0.1 %
• Static load smoothing	Approx. 0.5 %	Approx. 0.5 %
Residual ripple	< 150 mV <sub>pp</sub> (typ. 50mV <sub>pp</sub> )	< 150 mV <sub>pp</sub> (typ. 50mV <sub>pp</sub> )
Spikes (bandwidth: 20 MHz)	< 240 mV <sub>pp</sub> (typ. 150mV <sub>pp</sub> )	< 240 mV <sub>pp</sub> (typ. 150mV <sub>pp</sub> )
Adjustment range	22.8 ... 28.0 V	22.8 ... 28.0 V
Status display	Green LED for 24 V OK	Green LED for 24 V OK
Response on activation/deactivation	Overshoot of $V_{out}$ approx. 4 %	Overshoot of $V_{out}$ approx. 4 %
Startup delay/voltage rise	< 0.1 s at 230 V AC/typ. 50 ms	< 0.1 s at 230 V AC/typ. 50 ms
Rated current $I_{out rated}$	<b>5 A</b>	<b>5 A</b>
Current range		
• Up to +45 °C	0 ... 6 A	0 ... 6 A
• Up to +60 °C	0 ... 5 A	0 ... 5 A
Dynamic overcurrent on		
• Power-up on short-circuit	Typ. 17 A for 100 ms	Typ. 17 A for 100 ms
• Short-circuit during operation	Typ. 17 A for 200 ms	Typ. 17 A for 200 ms
Parallel switching for enhanced performance	Yes, 2 units	Yes, 2 units
<b>Efficiency</b>		
Efficiency at $V_{out rated}$ , $I_{out rated}$	Approx. 87 %	Approx. 87 %
Power loss at $V_{out rated}$ , $I_{out rated}$	Approx. 17 W	Approx. 17 W
<b>Closed-loop control</b>		
Dynamic mains compensation ( $V_{in rated} \pm 15$ %)	Typ. ±0.3 % $V_{out}$	Typ. ±0.3 % $V_{out}$
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %)	Typ. ±1 % $V_{out}$	Typ. ±1 % $V_{out}$
Load-step settling time		
• 50 to 100 %	Typ. 0.2 ms	Typ. 0.2 ms
• 100 to 50 %	Typ. 0.2 ms	Typ. 0.2 ms

**Technical specifications SITOP smart (continued)**

Power supply, type	5 A	5 A
<b>Order No.</b>	<b>6EP1 333-2AA01</b>	<b>6EP1 333-2BA01</b>
<b>Protection and monitoring</b>		
Output overvoltage protection	< 33 V	< 33 V
Current limit	Typ. 6.4 ... 6.6 A, overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Typ. 6.4 ... 6.6 A, overload capability 150 % $I_{out\ rated}$ up to 5 s/min
Short-circuit protection	Constant-current characteristic	Constant-current characteristic
Sustained short-circuit current rms value	ca. 10 A	ca. 10 A
Overload/short-circuit indicator	-	-
<b>Safety</b>		
Primary/secondary electrical isolation	Yes, safety extra-low output voltage $V_{out}$ to EN 60950 and EN EN 50178	Yes, safety extra-low output voltage $V_{out}$ to EN 60950 and EN EN 50178
Protection class	Class I	Class I
Leakage current	< 3.5 mA (typ. 0.4 mA)	< 3.5 mA (typ. 0.4 mA)
German Technical Inspectorate approval	Notified Body (CB Scheme)	Notified Body (CB Scheme)
CE marking	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 14), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL 508, CSA C22.2 No. 14), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
Explosion protection	ATEX-Richtlinie 94/9/EG, EX II 3G EEx nA II T4 U; UL 1604	ATEX-Richtlinie 94/9/EG, EX II 3G EEx nA II T4 U; UL 1604
FM approval	-	-
Marine type approval	GL	GL
Degree of protection (EN 60529)	IP20	IP20
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply-harmonics limitation		EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>		
Ambient temperature range	0... +60 °C with natural convection	0 ... +60°C with natural convection
Transportation/storage temperature range	-40 ... +85 °C	-40 ... +85°C
Humidity class	Climate class 3K3 to EN 60721, no condensation	Climate class 3K3 to EN 60721, no condensation
<b>Mechanics</b>		
Connections		
• Supply input L, N, PE	One screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> , single-core/finely stranded	One screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> , single-core/finely stranded
• Output +	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>
• Output -	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	50 x 125 x 125	50 x 125 x 125
Weight, approx.	0.5 kg	0.5 kg
Installation	Snaps onto DIN rail EN 60715 35x7,5/15	Snaps onto DIN rail EN 60715 35x7,5/15
<b>Accessoires</b>	-	-
Power supply, type	10 A	10 A
<b>Order No.</b>	<b>6EP1 334-2AA01</b>	<b>6EP1 334-2BA01<sup>1)</sup></b>
<b>Input</b>		
Rated voltage $V_{in\ rated}$	Single-phase AC <b>120/230 V AC</b> Set by means of selector switch on device	Single-phase AC <b>120/230 V AC</b> Set by means of selector switch on device
Voltage range	85 ... 132 V/170 ... 264 V AC	85 ... 132 V/170 ... 264 V AC
Overvoltage resistance	2.3 x $V_{in\ rated}$ , 1.3 ms	2.3 x $V_{in\ rated}$ , 1.3 ms
Mains buffering at $I_{out\ rated}$	> 20 ms at $V_{in} = 93/187\text{ V}$	> 20 ms at $V_{in} = 93/187\text{ V}$

# SIMATIC S7-200

## Power supplies

### Power supplies

#### Technical specifications SITOP smart (continued)

Power supply, type	10 A	10 A
Order No.	6EP1 334-2AA01	6EP1 334-2BA01 <sup>1)</sup>
Rated line frequency; rated line-frequency range	50/60Hz; 47 ... 63Hz	50/60 Hz; 47 ... 63 Hz
Rated current $I_{in rated}$	4.1/2.4 A	4.1/2.0 A
Switch-on current limit (+25 °C)	< 65 A, typ. 3 ms	< 65 A, typ. 3 ms
$I^2 t$	< 3.3 A <sup>2</sup> s	< 3.3 A <sup>2</sup> s
Built-in line-side fuse	T 6.3 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Recommended miniature circuit breaker (IEC 898) in the mains power input	From 10 A, Characteristic C	From 10 A, Characteristic C
<b>Output</b>	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $V_{out rated}$	<b>24 V DC</b>	<b>24 V DC</b>
Total tolerance	±3 %	±3 %
<ul style="list-style-type: none"> <li>• Stat. mains compensation</li> <li>• Static load smoothing</li> </ul>	Approx. 0.1 % Approx. 0.5 %	Approx. 0.1 % Approx. 0.5 %
Residual ripple	< 150 mV <sub>pp</sub> (typ. 50 mV <sub>pp</sub> )	< 150 mV <sub>pp</sub> (typ. 50 mV <sub>pp</sub> )
Spikes (bandwidth: 20 MHz)	< 240 mV <sub>pp</sub> (typ. 150 mV <sub>pp</sub> )	< 240 mV <sub>pp</sub> (typ. 150 mV <sub>pp</sub> )
Adjustment range	22.8 ... 28 V	22.8 ... 28 V
Status display	Green LED for 24 V OK	Green LED for 24 V OK
Response on activation / deactivation	Overshoot of $V_{out}$ approx. 4 %	Overshoot of $V_{out}$ approx. 4 %
Startup delay/voltage rise	< 0.1 s at 230 V AC/typ. 50 ms	< 0.1 s at 230 V AC/typ. 50 ms
Rated current $I_{out rated}$	<b>10 A</b>	<b>10 A</b>
Current range		
<ul style="list-style-type: none"> <li>• Up to +45 °C</li> <li>• Up to +60 °C</li> </ul>	0 ... 12 A 0 ... 10 A	0 ... 12 A 0 ... 10 A
Dynamic overcurrent on		
<ul style="list-style-type: none"> <li>• Power-up on short-circuit</li> <li>• Short-circuit during operation</li> </ul>	Typ. 30 A for 100 ms Typ. 33 A for 200 ms	Typ. 30 A for 100 ms Typ. 33 A for 200 ms
Parallel switching for enhanced performance	Yes, 2 units	Yes, 2 units
<b>Efficiency</b>		
Efficiency at $V_{out rated}$ ; $I_{out rated}$	Approx. 90 %	Approx. 91 %
Power loss at $V_{out rated}$ ; $I_{out rated}$	Approx. 27 W	Approx. 24 W
<b>Closed-loop control</b>		
Dyn. mains compensation ( $V_{in rated}$ ±15 %)	Typ. ±0.3 % $V_{out}$	Typ. ±0.3 % $V_{out}$
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %)	Typ. ±1 % $V_{out}$	Typ. ±1 % $V_{out}$
Load-step settling time		
<ul style="list-style-type: none"> <li>• 50 to 100 %</li> <li>• 100 to 50 %</li> </ul>	Typ. 0.2 ms Typ. 0.2 ms	Typ. 0.2 ms Typ. 0.2 ms
<b>Protection and monitoring</b>		
Output overvoltage protection	< 33 V	< 33 V
Current limitation	Typ. 12.5 to 13.5 A, overload capability 150 % $I_{out rated}$ up to 5 s/min	Typ. 12.5 ... 13.5 A, overload capability 150 % $I_{out rated}$ up to 5 s/min
Short-circuit protection	Constant current characteristic	Constant current characteristic
Sustained short-circuit current rms value	Approx. 16 A	Approx. 16 A
Overload/short-circuit indicator	-	-

1) SIPLUS module 6AG1 334-2BA01-4AA0 for use under medial load (e.g. sulfur chloride atmosphere).

### Technical specifications SITOP smart (continued)

Power supply, type	10 A	10 A
Order No.	6EP1 334-2AA01	6EP1 334-2BA01 <sup>1)</sup>
<b>Safety</b>		
Primary/secondary electrical isolation	Safety extra-low output voltage $V_{out}$ to EN 60950 and EN 50178	Safety extra-low output voltage $V_{out}$ to EN 60950 and EN 50178
Protection class	Class I	Class I
Leakage current	< 3.5 mA (typ. 0.8 mA)	< 3.5 mA (typ. 0.8 mA)
German Technical Inspectorate approval	Notified Body (CB certificate)	Notified Body (CB certificate)
CE marking	Yes	Yes
UL/cUL (CSA) approval	Yes, cULus-Listed (UL 508, CSA C22.2 No. 14), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	Yes, cULus-Listed (UL 508, CSA C22.2 No. 14), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
Explosion protection	ATEX EX II 3G EEx nA II T4 U; UL 1604	ATEX EX II 3G EEx nA II T4 U; UL 1604
FM approval	-	-
Marine approval	GL	GL
Degree of protection (EN 60529)	IP20	IP20
<b>EMC</b>		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply-harmonics limitation	-	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
<b>Operating data</b>		
Ambient temperature range	0 ... +60 °C with natural convection	0 ... +60 °C with natural convection
Transport/storage temperature range	-40 ... +85 °C	40 ... +85 °C
Humidity class	Climate class 3K3 to EN 60721, no condensation	Climate class 3K3 to EN 60721, no condensation
<b>Mechanics</b>		
Connections		
Supply input L, N, PE	One screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded	One screw terminal each for 0.5 ... 2.5 mm <sup>2</sup> single-core/finely stranded
Output +	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>
Output -	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>	2 screw terminals for 0.5 ... 2.5 mm <sup>2</sup>
Dimensions (W x H x D) in mm	70 x 125 x 125	70 x 125 x 125
Weight, approx.	0.75 kg	0.8 kg
Installation	Snaps onto DIN rail EN 60715 35x7,5/15	Snaps onto DIN rail EN 60715 35x7,5/15
Accessories	-	-

1) SIPLUS module 6AG1 334-2BA01-4AA0 for use under medial load (e.g. sulfur chloride atmosphere).

Ordering Data	Order No.	Ordering Data	Order No.
<b>Regulated load current supply SITOP power 3.5 A</b>		<b>Regulated load current supply SITOP smart</b>	
120/230 V AC, 24 V DC /3.5 A	6EP1 332-1SH31	120/230 V AC, 24 V DC	
120/230 V AC, 24 V DC /3.5 A; (enhanced temperature range and medial exposure)	6AG1 203-1SH31-2AA00	2.5 A	6EP1 332-2BA10
<b>Mounting bracket</b>	6EP1 971-1AA01	5 A	6EP1 333-2AA01
For space-saving assembly of the SITOP power load current supply unit to the rear panel of the control cabinet (power supply is attached to the rear panel of the housing with the side wall); for control cabinets with depths of 240 mm or more		5 A, with restriction of the supply harmonics acc. to EN 61000-3-2	6EP1 333-2BA01
<b>Regulated load current supply LOGO!Power 24 V/4 A</b>	6EP1 332-1SH51	10 A	6EP1 334-2AA01
100 ... 240 V AC, 24 V DC/4 A		10 A, with restriction of the supply harmonics acc. to EN 61000-3-2	6EP1 334-2BA01
		10 A, with restriction of the supply harmonics acc. to EN 61000-3-2; medial exposure	6AG1 334-2BA01-4AA0



# SIMATIC S7-200

## Human machine interface

### Text Display TD 100C

#### Overview



- The low-cost text display for the S7-200 with customized display
- For HMI functions:  
Display of message texts, interventions in the control program, setting of inputs and outputs
- Direct connection to CPU interface
- No separate power supply required
- No separate parameterization software required
- Front design can be selected individually
- Addressing and setting of contrast in supplied menu

#### Technical specifications

6ES7 272-1BA10-0YA1	
<b>Power supply</b>	
Input voltage	
• Rated value (DC)	24 V; Supply from S7-200 communication interface
Input current	
• Rated value at DC 24 V	25 mA
<b>MPI</b>	
Transmission speed (PPI), max.	187.5 kBit/s
<b>1st interface</b>	
Physics	RS 485
Functionality	
• PPI	Yes
PPI	
• Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC

6ES7 272-1BA10-0YA1	
<b>Operator control and monitoring</b>	
Display	
• Type	LC display (reflecting)
Operating/fault messages	
• Number of lines	4
• Number of characters per line	12; characters/line: 12 or 16 characters/line: Chinese 8
• Font size	3.34 mm
<b>Environmental requirements</b>	
Operating temperature	
• min.	0 °C
• max.	60 °C
Storage/transport temperature	
• min.	-20 °C
• max.	70 °C
<b>Degree of protection</b>	
IP 65	Yes
<b>Dimensions</b>	
Cabinet/switchboard strength	1,5 mm; 1,5 to 4 mm
<b>Dimensions</b>	
Dimensions	
• Width	90 mm
• Height	76 mm
• Depth	36 mm; max. 44 mm with fittings
• Mounting cutout, width	82 mm
• Mounting cutout, height	69.5 mm
Weights	
• Weight, approx.	120 g

#### Ordering Data

	Order No.
<b>Text Display TD 100C</b>	
With individually configurable control elements on the device front; for connecting to SIMATIC S7-200; for use with STEP 7 Micro/WIN V4 and higher, plug-in cable required	B7 <b>6ES7 272-1BA10-0YA1</b>
<b>Connecting cables</b>	
For connecting TD 100C or TD 200C to S7-200	<b>6ES7 901-3EB10-0XA0</b>
<b>Blank foils</b>	
For printing customized keyboard layouts; 6 perforated foils per sheet; 10 sheets per packing unit	<b>6ES7 272-1BF00-7AA0</b>
<b>Accessories</b>	
<b>Accessories for supplementary ordering</b>	see catalog ST 80

B7: Subject to export regulations: AL: N and ECCN: EAR99H



# SIMATIC S7-200

## Human machine interface

### Text Display TD 200

#### Overview



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

#### Technical specifications

6ES7 272-0AA30-0YA1	
<b>Power supply</b>	
Input voltage	
• Rated value (DC)	24 V; Power supplied over the S7-200 communications interface or optional external power supply unit; the CPU sensor power supply (24 V DC) is not subjected to load
Input current	
• Rated value at DC 24 V	120 mA
<b>MPI</b>	
Transmission speed (PPI), max.	187.5 kBit/s
<b>1st interface</b>	
Physics	RS 485
Functionality	
• PPI	Yes
PPI	
• Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC

6ES7 272-0AA30-0YA1	
<b>Operator control and monitoring</b>	
Display	
• Type	LCD backlit
<b>Operating/fault messages</b>	
• Number of lines	2
• Number of characters per line	20; Chars/line: ASCII, Cyrillic; 10 chars/line: Chinese
• Font size	5 mm
<b>Environmental requirements</b>	
Operating temperature	
• min.	0 °C
• max.	60 °C
Storage/transport temperature	
• min.	-40 °C
• max.	70 °C
<b>Degree of protection</b>	Yes; at front
IP 65	
<b>Dimensions</b>	
Cabinet/switchboard strength	0.3 mm; 0.3 to 4 mm
<b>Dimensions</b>	
Dimensions	
• Width	148 mm
• Height	76 mm
• Depth	27 mm
• Mounting cutout, width	138 mm
• Mounting cutout, height	68 mm
<b>Weights</b>	
• Weight, approx.	250 g

#### Ordering Data

Ordering Data	Order No.
<b>Text Display TD 200</b>	
for connection to SIMATIC S7-200; can be used with STEP 7-Micro/WIN V3.2 SP4 or higher, incl. connecting cable	<b>6ES7 272-0AA30-0YA1</b>
<b>Connecting cables</b>	
For connecting TD 100C or TD 200C to S7-200	<b>6ES7 901-3EB10-0XA0</b>
<b>Accessories</b>	
<b>Accessories for supplementary ordering</b>	see catalog ST 80

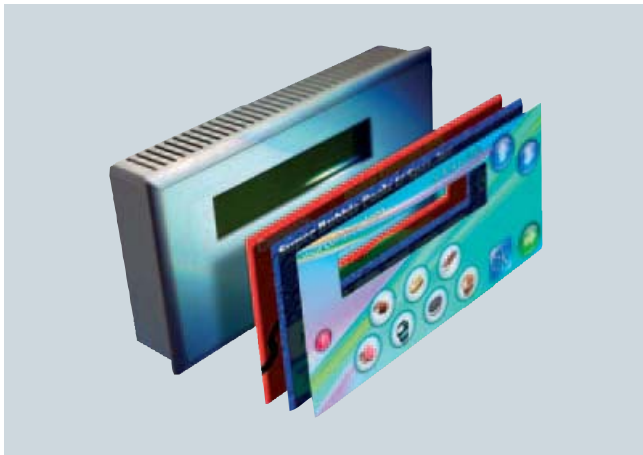
B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200

## Human machine interface

### Text Display TD 200C

#### Overview



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

#### Technical specifications

6ES7 272-1AA10-0YA1	
<b>Power supply</b>	
Input voltage	
• Rated value (DC)	24 V; Power supplied over the S7-200 communications interface or optional external power supply unit; the CPU sensor power supply (24 V DC) is not subjected to load
Input current	
• Rated value at DC 24 V	120 mA
<b>MPI</b>	
Transmission speed (PPI), max.	187.5 kBit/s
<b>1st interface</b>	
Physics	RS 485
Functionality	
• PPI	Yes
PPI	
• Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC

6ES7 272-1AA10-0YA1	
<b>Operator control and monitoring</b>	
Display	
• Type	LCD backlit
<b>Operating/fault messages</b>	
• Number of lines	2
• Number of characters per line	20; Chars/line: ASCII, Cyrillic; 10 chars/line: Chinese
• Font size	5 mm
<b>Environmental requirements</b>	
Operating temperature	
• min.	0 °C
• max.	60 °C
Storage/transport temperature	
• min.	-20 °C
• max.	70 °C
<b>Degree of protection</b>	
IP 65	Yes; at front
<b>Dimensions</b>	
Cabinet/switchboard strength	0.3 mm; 0.3 to 4 mm
<b>Dimensions</b>	
Dimensions	
• Width	148 mm
• Height	76 mm
• Depth	28 mm
• Mounting cutout, width	138 mm
• Mounting cutout, height	68 mm
<b>Weights</b>	
• Weight, approx.	200 g

#### Ordering Data

#### Order No.

##### Text Display TD 200C

With individually configurable control elements on the device front;  
for connecting to SIMATIC S7-200; for use with STEP 7-Micro/WIN V4 and higher, incl. plug-in cable

B7

6ES7 272-1AA10-0YA1

##### Connecting cables

For connecting TD 100C or TD 200C to S7-200

6ES7 901-3EB10-0XA0

##### Blank foils

For printing customized keyboard layouts;  
3 perforated faceplates per sheet;  
10 sheets per packing unit

B7

6ES7 272-1AF00-7AA0

#### Accessories

##### Accessories for supplementary ordering

see catalog ST 80

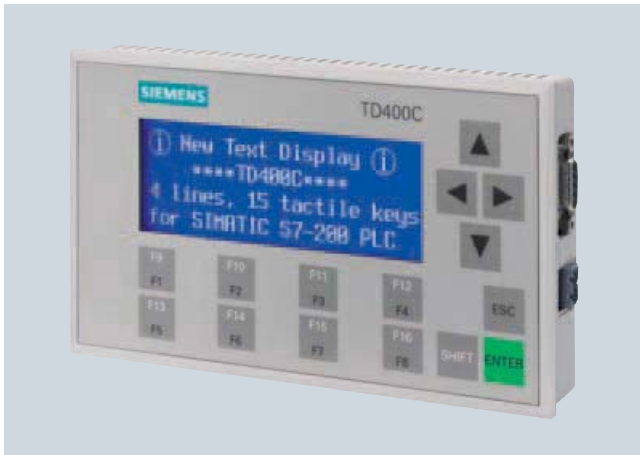
B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200

## Human machine interface

### Text Display TD 400C

#### Overview



- Multi-screen workstation and extremely good readability thanks to backlit four-line display
- Customizable operator interface with 15 tactile keys
- Acoustic and visual feedback from key operation
- Optimal support of the S7-200:
  - Direct connection to the S7-200 interface via supplied cable
  - No separate power supply required
  - Parameterization with STEP 7-Micro/WIN V4 SP6

#### Technical specifications

6AV6 640-0AA00-0AX1	
<b>Supply voltage</b>	
Supply voltage	24 V DC
permissible range	DC
<b>Memory</b>	
Type of storage	
• Memory usable for project data/Options	No info
<b>Configuration</b>	
Configuration tool	MicroWin (to be ordered separately)
<b>Display</b>	
Display type	STN, Black/white
Size	3.7"
Resolution (WxH in pixel)	192 x 64
MTBF backlighting (at 25 °C)	about 20,000 hours

6AV6 640-0AA00-0AX1	
<b>Operating mode</b>	
Operating elements	Membrane keyboard
Function keys, programmable	15 function keys
Membrane keyboard	Yes
<b>Ambient conditions</b>	
Temperature	
• Operation	0 °C to +50 °C
• Transport, storage	-20 °C to +60 °C
<b>Degree of protection</b>	
Front	IP65, NEMA 4, NEMA 4x, NEMA 12 (when installed)
Rear	IP20
<b>Certifications &amp; Standards</b>	
Certifications	CE, FM Class I Div. 2, UL, C-TICK, NEMA 4, NEMA 4x, NEMA 12
<b>interfaces</b>	
Interfaces	1 x RS485 (max. 187.5 Mbit/s)
<b>Dimensions</b>	
Weights	
• Weight	0.33 kg

#### Ordering Data

Ordering Data	Order No.
<b>Text Display TD 400C</b>	B7 <b>6AV6 640-0AA00-0AX1</b>
With customizable operator interface on the device front; for connecting to SIMATIC S7-200; can be used from STEP 7-Micro/WIN V4 SP6, incl. connecting cable	
<b>Connecting cables</b>	<b>6ES7 901-3EB10-0XA0</b>
For connecting TD 100C/TD 200C or TD 400C to S7-200	
<b>Blank foils</b>	<b>6AV6 671-0AP00-0AX0</b>
For printing customized keyboard layouts; 2 perforated films per sheet; 10 sheets per pack	
<b>Accessories</b>	
<b>Accessories for supplementary ordering</b>	see catalog ST 80

B7: Subject to export regulations: AL: N and ECCN: EAR99H

# SIMATIC S7-200

## Human machine interface

### SIMATIC TP 177micro

#### Overview



- Touch Panel for operator control and monitoring of small machines and plants
- Low-cost entry-level product in the category of touch panels with graphics capability and all the basic functions required for simple tasks
- Pixel graphics 5.7" STN touch screen (analog/resistive), Bluemode (4 levels)
- Specially for SIMATIC S7-200:  
Communication to the PLC through the integrated interface over a point-to-point link
- Connection to the PLC over MPI or PROFIBUS DP cable
- SIMATIC TP 177micro is the innovative successor to the Touch Panels SIMATIC TP 070/TP 170micro

#### Technical specifications

6AV6 640-0CA11-0AX1	
<b>Supply voltage</b>	
Supply voltage	24 V DC
permissible range	+20.4 V to +28.8 V DC
Rated current	0.24 A
<b>Memory</b>	
Type of storage	
Type	Flash
Memory usable for project data/Options	256 KB usable memory for user data
<b>Time</b>	
Clock	
• Type	Software clock, Not battery backed
<b>Configuration</b>	
Configuration tool	WinCC flexible Micro Version 2004 SP1, HSP or higher (to be ordered separately)
<b>Display</b>	
Display type	STN, 4 Blue levels
Size	5.7"
Resolution (WxH in pixel)	320 x 240
MTBF backlighting (at 25 °C)	about 50,000 hours
<b>Operating mode</b>	
Operating elements	Touch screen
Function keys, programmable	None
System keys	0
Touchscreen	analog, resistive
Numeric/alphabetical input	Yes / Yes
<b>Ambient conditions</b>	
Mounting position	Vertical
maximum permissible angle of inclination without external ventilation	+/- 35 °
max. relative humidity (in %)	90%

6AV6 640-0CA11-0AX1	
<b>Temperature</b>	
• Operation (vertical installation)	0 °C to +50 °C
• Operation (max. tilt angle)	0 °C to +40 °C
• Transport, storage	-20 °C to +60 °C
<b>Degree of protection</b>	
Front	IP65, NEMA 4x, (when installed)
Rear	IP20
<b>Certifications &amp; Standards</b>	
Certifications	CE, GL, ABS, BV, DNV, LRS, FM Class I Div. 2, UL, CSA, cULus, EX-Zone 2 (available soon), EX-Zone 22 (available soon), C-TICK, NEMA 4x
<b>interfaces</b>	
Interfaces	1 x RS485 (max. 187.5 Mbit/s)
<b>Operating systems</b>	
Operating system	LINUX
<b>Processor</b>	
Processor	ARM
<b>Functionality under WinCC flexible</b>	
Task planner	Yes
Help system	Yes
Status/control	Not possible
Message system	
• Number of messages	500
• Bit messages	Yes
• Analog messages	Yes
• Message buffer	Ring buffer (n x 128 entries)
Number of process images	
• Process images	250
• Variables	250
• Limit values	Yes
• Multiplexing	Yes

### Technical specifications (continued)

6AV6 640-0CA11-0AX1	
Image elements	
• Text objects	500 text elements
• Graphics object	Bit maps, icons, icon (full-screen), vector graphics
• dynamic objects	Diagrams, bar graphs
Lists	
• Text lists	150
• Graphics list	100
• Libraries	Yes
Security	
• Number of user groups	1
• Passwords exportable	Yes
• Number of users	1
Data medium support	
• Multi Media Card	No
Recording	
• Printer driver	-
Fonts	
• Keyboard fonts	US American (English)
Languages	
• Online languages	5
• Configuration languages	D, GB, F, I, E, CHN "traditional", CHN "simplified", DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ / SK, TR, H
• Fonts	WinCC flexible Standard, symbol languages
Transfer (Upload/Download)	
• Transfer of configuration	serial
Process coupling	
• Connection to controller	for S7-200, see section on "System interfaces"
Expandability/openness	
• Open Platform Program	No
<b>Dimensions</b>	
Front of enclosure (W x H)	212 mm x 156 mm
Mounting cutout/Device depth (W x H/D) in mm	198 mm x 142 mm / 45 mm device depth
<b>Dimensions</b>	
Weights	0.75 kg

### Ordering Data

	Order No.
<b>SIMATIC TP 177micro</b> B9	<b>6AV6 640-0CA11-0AX1</b>
Touch Panel for connection to the SIMATIC S7-200, 5.7" STN display	
<b>TP 177micro starter package</b> B1	<b>6AV6 650-0DA01-0AA0</b>
Consisting of:	
• TP 177micro Touch Panel	
• SIMATIC WinCC flexible Micro engineering software	
• SIMATIC HMI Manual Collection (DVD), 5 languages (English, French, German, Italian, Spanish), comprising: all currently available user manuals, manuals and communication manuals for SIMATIC HMI	
• MPI cable (5m) (for test purposes)	
<b>Configuration</b>	
with SIMATIC WinCC flexible	
<b>Documentation (to be ordered separately)</b>	
<b>Operating Instructions OP 73micro, TP 177micro</b>	
• German	<b>6AV6 691-1DF01-0AA0</b>
• English	<b>6AV6 691-1DF01-0AB0</b>
• French	<b>6AV6 691-1DF01-0AC0</b>
• Italian	<b>6AV6 691-1DF01-0AD0</b>
• Spanish	<b>6AV6 691-1DF01-0AE0</b>
<b>WinCC flexible Micro User Manual</b>	
• German	<b>6AV6 691-1AA01-3AA0</b>
• English	<b>6AV6 691-1AA01-3AB0</b>
• French	<b>6AV6 691-1AA01-3AC0</b>
• Italian	<b>6AV6 691-1AA01-3AD0</b>
• Spanish	<b>6AV6 691-1AA01-3AE0</b>
<b>SIMATIC HMI Manual Collection</b> B8	<b>6AV6 691-1SA01-0AX0</b>
Electronic documentation, on DVD	
5 languages (English, French, German, Italian, Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI	
<b>Accessories</b>	
<b>Accessories for supplementary ordering</b>	see catalog ST 80

B1: Subject to export regulations: AL: N and ECCN: 5D002ENC3

B8: Subject to export regulations: AL: N and ECCN: EAR99S

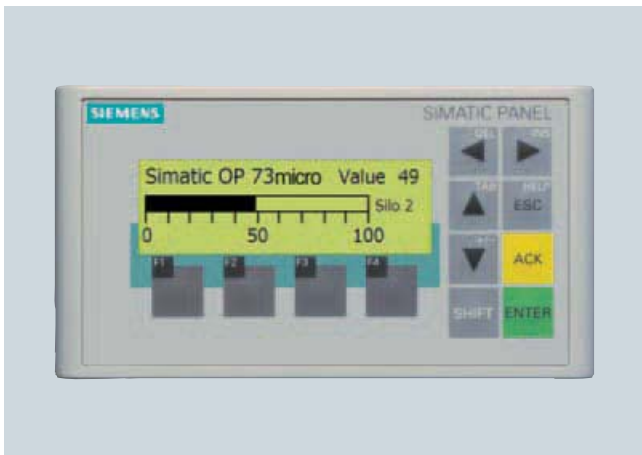
B9: Subject to export regulations: AL: N and ECCN: EAR99T

# SIMATIC S7-200

## Human machine interface

### SIMATIC OP 73micro

#### Overview



- Operator Panel for controlling and monitoring machines and systems
- Graphics in a new dimension: small and smart
- Pixel-graphics 3" LCD, monochrome
- 8 system keys, 4 user-configurable function keys
- Specific to the SIMATIC S7-200:  
Communication with the controller takes place via the integrated interface (point-to-point)
- Connection to the controller via MPI or PROFIBUS DP cable

#### Technical specifications

	6AV6 640-0BA11-0AX0
<b>Supply voltage</b>	
Supply voltage	24 V DC
permissible range	+20.4 V to +28.8 V DC
Rated current	0.1 A
<b>Memory</b>	
Type of storage	
Type	Flash
Memory usable for project data/Options	128 KB usable memory for user data
<b>Time</b>	
Clock	
• Type	Software clock, Not battery backed
<b>Configuration</b>	
Configuration tool	WinCC flexible Micro Version 2004 SP1, HSP or higher (to be ordered separately)
<b>Display</b>	
Display type	STN, Black/white
Size	3"
Resolution (WxH in pixel)	160 x 48
MTBF backlighting (at 25 °C)	about 100,000 hours
<b>Operating mode</b>	
Operating elements	Membrane keyboard
Function keys, programmable	4 function keys
System keys	8
Touchscreen	No
Numeric/alphabetical input	Yes / Yes
Connection for mouse/keyboard/barcode reader	- / - / -

	6AV6 640-0BA11-0AX0
<b>Ambient conditions</b>	
Mounting position	Vertical
maximum permissible angle of inclination without external ventilation	+/- 80 °
max. relative humidity (in %)	90%
Temperature	
• Operation (vertical installation)	0 °C to +50 °C
• Operation (max. tilt angle)	0 °C to +40 °C
• Transport, storage	-20 °C to +60 °C
<b>Degree of protection</b>	
Front	IP65, NEMA 4x, (when installed)
Rear	IP20
<b>Certifications &amp; Standards</b>	
Certifications	CE, GL, ABS, BV, DNV, LRS, UL, CSA, cULus, C-TICK, NEMA 4x
<b>Interfaces</b>	
Interfaces	1 x RS485 (max. 187.5 Mbit/s)
<b>Operating systems</b>	
Operating system	LINUX
<b>Processor</b>	
Processor	ARM
<b>Functionality under WinCC flexible</b>	
Task planner	Yes
Help system	Yes
Status/control	Not possible
Message system	
• Number of messages	250
• Bit messages	Yes
• Analog messages	Yes
• Message buffer	Ring buffer (n x 100 entries)

# SIMATIC S7-200

## Human machine interface

### SIMATIC OP 73micro

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#### Technical specifications (continued)

6AV6 640-0BA11-0AX0	
Number of process images	
• Process images	250
• Variables	500
• Limit values	Yes
• Multiplexing	Yes
Image elements	
• Text objects	1,000 text elements
• Graphics object	Bit maps, icons, icon (full-screen)
• dynamic objects	Bar graphs
Lists	
• Text lists	150
• Graphics list	0
• Libraries	Yes
Security	
• Number of user groups	1
• Passwords exportable	Yes
• Number of users	1
Data medium support	
• Multi Media Card	No
Recording	
• Printer driver	-
Fonts	
• Keyboard fonts	US American (English)
Languages	
• Online languages	5
• Configuration languages	D, GB, F, I, E, CHN "traditional", CHN "simplified", DK, FIN, GR, J, KP / ROK, NL, N, PL, P, RUS, S, CZ / SK, TR, H
• Fonts	WinCC flexible Standard, symbol languages
Transfer (Upload/Download)	
• Transfer of configuration	serial
Process coupling	
• Connection to controller	for S7-200, see section on "System interfaces"
Expandability/openness	
• Open Platform Program	No
<b>Dimensions</b>	
Front of enclosure (W x H)	154 mm x 84 mm
Mounting cutout/Device depth (W x H/D) in mm	138 mm x 68 mm / 28.5 mm device depth
<b>Dimensions</b>	
Weights	
Weight	0.25 kg

#### Ordering Data

#### Order No.

<b>SIMATIC OP 73micro</b>	B9	<b>6AV6 640-0BA11-0AX0</b>
Operator panel for connection to the SIMATIC S7-200, with 3" display, monochrome incl. mounting accessories		
<b>OP 73micro starter package</b>	B1	<b>6AV6 650-0BA01-0AA0</b>
Consisting of:		
<ul style="list-style-type: none"> <li>OP 73micro Operator Panel</li> <li>SIMATIC WinCC flexible Micro engineering software</li> <li>SIMATIC HMI Manual Collection, 5 languages (English, French, German, Italian, Spanish), comprising: all currently available user manuals, manuals and communication manuals for SIMATIC HMI</li> <li>MPI cable (5 m) (for test purposes)</li> </ul>		
<b>Configuration</b>		
with SIMATIC WinCC flexible		
<b>Documentation (to be ordered separately)</b>		
<b>Operating Instructions OP 73micro/TP 177micro</b>		
• German		<b>6AV6 691-1DF01-0AA0</b>
• English		<b>6AV6 691-1DF01-0AB0</b>
• French		<b>6AV6 691-1DF01-0AC0</b>
• Italian		<b>6AV6 691-1DF01-0AD0</b>
• Spanish		<b>6AV6 691-1DF01-0AE0</b>
<b>User Manual WinCC flexible Micro</b>		
• German		<b>6AV6 691-1AA01-3AA0</b>
• English		<b>6AV6 691-1AA01-3AB0</b>
• French		<b>6AV6 691-1AA01-3AC0</b>
• Italian		<b>6AV6 691-1AA01-3AD0</b>
• Spanish		<b>6AV6 691-1AA01-3AE0</b>
<b>SIMATIC HMI Manual Collection B8</b>		<b>6AV6 691-1SA01-0AX0</b>
Electronic documentation, on DVD		
5 languages (English, French, German, Italian and Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI		
<b>Accessories</b>		
<b>Accessories for supplementary ordering</b>		see catalog ST 80

B1: Subject to export regulations: AL: N and ECCN: 5D002ENC3

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# SIMATIC S7-200

## Software, Accessories

### Software

#### Overview

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

The following are available:

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

### PPI cable

#### Overview

- For connecting devices with RS 232 or USB interface to SIMATIC S7-200 or PPI network (RS 485)
- The following are available:
  - Intelligent RS 232/PPI multimaster cable:  
For connecting devices with RS 232 interface to the RS 485 interface of the SIMATIC S7-200 or to the PPI network; can be used as master on a multimaster PPI network.

- Intelligent USB/PPI multimaster cable:  
For connecting devices with USB interface to the RS 485 interface on SIMATIC S7-200 or to the PPI network; can be used as master on a multimaster PPI network.

#### Technical specifications

	6ES7 901-3CB30-0XA0	6ES7 901-3DB30-0XA0
<b>Power supply</b>		
Description	from CPU	from USB interface
<b>Protocols</b>		
PPI	Yes; 10/11 bit	Yes; 10/11 bit
ASCII	Yes; Freeport	
<b>MPI</b>		
Transmission speed (PPI), max.	187.5 kBit/s; 9.6/19.3/187.5 Kbit/s; setting: DIP switch; RS 232 not required	187.5 kBit/s; 9.6/19.2/187.5 Kbit/s; setting: not necessary
<b>Status information/alarms/diagnostics</b>		
Diagnostics indication LED		
• Description	Tx (green): RS-232-transmit indication; Rx (green): RS-232- receive indication; PPI (green): RS-485- transmit indication	Tx (green): USB transmit indication; Rx (green): USB receive indication; PPI (green): RS-485- transmit indication

	6ES7 901-3CB30-0XA0	6ES7 901-3DB30-0XA0
<b>Isolation</b>		
Galvanic isolation	1	1
<b>Software requirement</b>		
Software required	STEP 7 Micro/WIN V3.2 SP4 or higher	STEP 7 Micro/WIN V3.2 SP4 or higher
<b>Dimensions</b>		
Weights		
Weight, approx.	300 g	300 g

#### Ordering Data

##### Intelligent RS 232/PPI multi-master cable

For connecting devices with an RS 232 interface to SIMATIC S7-200 or PPI network Master in multi-master PPI network

#### Order No.

6ES7 901-3CB30-0XA0

##### Intelligent USB/PPI multi-master cable

For connecting devices with a USB interface to SIMATIC S7-200 or PPI network; Master in multi-master PPI network

#### Order No.

6ES7 901-3DB30-0XA0



#### Overview

Intelligent RS 232/PPI multi-master cable; for connecting devices with RS 232 interface to the RS 485 interface of the SIMATIC S7-200 or to the PPI network; can be used as master in a multi-master PPI network

<b>SIPLUS cable 901</b>	
<b>Order No.</b>	<b>6AG1 901-3CB30-2XA0</b>
<b>Order No. based on</b>	<b>6ES7 901-3CB30-0XA0</b>
Ambient temperature range	-25 to +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible
Ambient conditions	Suitable for extraordinary medial load (e.g. by chloric and sulphuric atmospheres).
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1).	No
Approvals	CE, cUL (available soon)
Technical data	The technical data are identical with the technical data of the based on modules.

#### Ordering Data

##### SIPLUS cable 901

(extended temperature and media exposure)

For connecting devices with an RS 232 interface to SIMATIC S7-200 or PPI network Master in multi-master PPI network

#### Order No.

**6AG1 901-3CB30-2XA0**

# SIMATIC S7-200



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