SIMATIC S7-200

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Siemens ST 70 · 2007

SIMATIC S7-200
Introduction

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

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■ **Technical specifications**

General technical specifications SIMATIC S7-200	
Degree of protection	IP20 in accordance with IEC 529
Ambient temperature	
• Operation (95% relative humidity)	
- With horizontal mounting	0 to 55 °C
- With vertical mounting	0 to 45 °C
• Transport and storage	-40 to +70 °C
- with 95% relative humidity	25 to 55 °C
Isolation	
• 5/24 V DC circuits	Test voltage 500 V AC
• 115/230 V AC circuits to ground	Test voltage 1500 V AC
• 115/230 V AC circuits to 115/230 V AC circuits	Test voltage 1500 V AC
• 230 V AC circuits to 5/24 V DC circuits	Test voltage 1500 V AC
• 115 V AC circuits to 5/24 V DC circuits	Test voltage 1500 V AC
Electromagnetic compatibility	Requirements of EMC law
• Noise immunity to EN 50082-2	Tested according to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
• Emitted interference according to EN 50081-1 and EN 50081-2	Tested according to EN 55011, Class A, Group 1 and EN 55011, Class B, Group 1
Mechanical rating	
• Vibrations, tested according to/tested with	IEC 68, Part 2-6: 10 to 57 Hz; constant amplitude 0.3 mm; 58 to 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in control cabinet); type of vibration: frequency cycles with a rate of change of 1 octave/minute; vibration duration: 10 frequency cycles per axis in each direction of the 3 mutually perpendicular axes
• Shock, tested according to/tested with	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	
Climatic environmental conditions	
Temperature	Horizontal mounting: -25 °C top 70 °C Vertical mounting: -25 °C to 50 °C
Relative humidity	5 to 95%; transient condensation permissible, corresponding to relative humidity (RH-), stress grade 2 according to IEC 1131-2 and IEC 721 3-3 class 3K5
Transient icing	-25 °C to 0 °C IEC 721 3-3 class 3K5
Atmospheric pressure	1080 to 795 hPa corresponding to a height of −1000 to 2000 m
Pollutant concentration	SO_2: < 0,5 ppm; relative humidity <60%, test: 10 ppm, 4 days
	H_2S: < 0,1 ppm; relative humidity <60%, test: 1 ppm, 4 days (according to IEC 721 3-3; class 3C3)
Mechanical environmental conditions	
Vibrations	Type of vibration: frequency progressions changing at 1 octave per minute. 2 Hz ≤ f ≤ 9 Hz, constant amplitude 3,0 mm, 9 Hz ≤ f ≤ 150 Hz, constant acceleration 1 g, duration of vibration: 10 frequency progressions per axis in each direction of the three mutually perpendicular axes
	Vibration testing according to IEC 68 section 2-6 (sinus) and IEC 721 3-3, class 3M4
Shock	Type of shock: semisinusoidal, shock strength: 15 g peak value, duration 11 ms, shock direction: 3 shocks each in +/- direction on each of the mutually perpendicular axes
	Shock testing according to IEC 68 section 2-27
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1	Yes[1]

1) Not valid for:
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 226

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■ 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
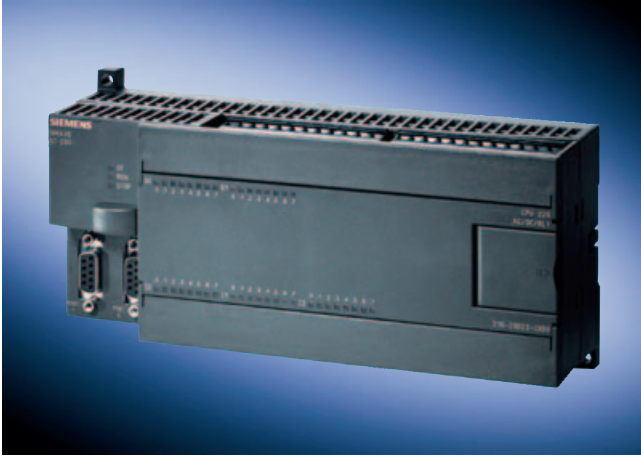
■ Overview CPU 224 XP

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

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

Technical specifications

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Supply voltages				
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
Voltages and currents				
Load voltage L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	5 V	20.4 V	5 V
• permissible range, upper limit (DC)	28.8 V	30 V	28.8 V	30 V
Load voltage L1				
• Rated value (AC)		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC
• permissible range, lower limit (AC)		5 V		5 V
• permissible range, upper limit (AC)		250 V		250 V
• permissible frequency range, lower limit		47 Hz		47 Hz
• permissible frequency range, upper limit		63 Hz		63 Hz
Current consumption				
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

SIMATIC S7-200
Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP, 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
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 (DC 5 V) 340mA		140 mA; 20 to 70 mA (240 V), 40 to 140 mA (120 V); output current for expansion modules (DC 5 V) 340 mA
Backup battery				
• Backup time, max.	50 h; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module	50 h; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module	50 h; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module	50 h; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module
Memory				
Memory				
• 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 KByte	2 KByte	2 KByte	2 KByte
- Program memory, max.	4 KByte	4 KByte	4 KByte	4 KByte
Backup				
• present	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering
CPU/processing times				
for bit operations, max.	0.22 µs	0.22 µs	0.22 µs	0.22 µs
Times/counters and their remanence				
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
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

■ **Technical specifications** (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
S7 times				
• Time range				
- lower limit	1 ms	1 ms	1 ms	1 ms
- upper limit	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min
Data areas and their remanence				
Flag				
• Number, max.	32 Byte	32 Byte	32 Byte	32 Byte
• Remanence available	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7
• of which 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
Hardware configuration				
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 may be used. Due to limited output current, the use of expansion modules may be subject to restrictions.	2; Only expansion modules of the S7-22x series may be used (due to limited output current, the use of expansion modules may be subject to restric- tions.)
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)
Connection point				
pluggable I/O terminals	No	No	No	No
1st interface				
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	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	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	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	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	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	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

SIMATIC S7-200
Central processing units

CPU 221, CPU 222, CPU 224, CPU 224 XP, 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
Functionality				
• 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: 0.3/0.6/1.2/2.4/4.8/9.6/ 19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter	Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/ 19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter	Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/ 19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter	Yes; as a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/ 19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter
MPI				
• Transmission speeds, max.	187.5 kBit/s	187.5 kBit/s	187,5 kBit/s	187.5 kBit/s
• Transmission speeds, max.	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s	19.2 kBit/s
CPU/programming				
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, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions
User program protection/password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection
Program processing	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	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	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
Digital inputs				
Number of digital inputs	6; integrated	6; integrated	8	8
Cable length				
• Cable length, shielded, max.	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m
• 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
m/p-reading	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group	Yes; optionally, per group

■ **Technical specifications** (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
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
  - at " to "1", min.
  - at "0" to "1", max.
	Yes; all
	0.2 ms
	12.8 ms
		Yes; all
		0.2 ms
		12.8 ms
			Yes; all
			0.2 ms
			12.8 ms
				Yes; all
				0.2 ms
				12.8 ms

• for interrupt inputs - programmable	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3
• 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
Digital outputs				
Number of digital outputs	4; Transistor	4; Relay	6; Transistor	6; Relay
Cable length, shielded, max.	500 m	500 m	500 m	500 m
Cable length unshielded, max.	150 m	150 m	150 m	150 m
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		5 W	
Output voltage				
• for signal "1", min.	20 V DC	L+/L1	20 V DC	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. (A0.2 to A0.3) 15 µs; of the pulse outputs, max. (A0.0 to A0.1) 2 µs	10 ms; all outputs	15 µs; of the standard outputs, max. (A0.2 to A0.5) 15 µs; of the pulse outputs, max. (A0.0 to A0.1) 2 µs	10 ms; all outputs
• "1" to "0", max.	130 µs; of the standard outputs, max. (A0.2 to A0.3) 100 µs; of the pulse outputs, max. (A0.0 to A0.1) 10 µs	10 ms; all outputs	130 µs; of the standard outputs, max. (A0.2 to A0.5) 100 µs; of the pulse outputs, max. (A0.0 to A0.1) 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; A0.0 to A0.1		20 kHz; A0.0 to A0.1	
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

SIMATIC S7-200
Central processing units

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

■ **Technical specifications** (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Relay outputs				
Number of operating cycles		10,000,000; mechanically 10 million, at rated load voltage 100,000		10,000,000; mechanically 10 million, at rated load voltage 100,000
Analog inputs				
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
Encoder supply				
24 V encoder supply				
• 24 V	Yes; permissible range: 15.4 to 28.8 V	Ja; permissible range: 20,4 to 28,8 V	Yes; permissible range: 15.4 to 28.8 V	Yes; permissible range: 20.4 to 28.8 V
• Short-circuit protection	Yes; electronic at 600 mA	Yes; electronic at 600 mA	Yes; electronic at 600 mA	Yes; electronic at 600 mA
• Output current, max.	180 mA	180 mA	180 mA	180 mA
Encoder				
Connectable encoders				
• 2-wire BEROS	Yes	Yes	Yes	Yes
• permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA	1 mA
Integrated Functions				
Number of counters	4; high-speed counters (each 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 2 incremental encoders with 2 pulse series offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl. calling subroutine with any content) on reaching setpoint; change counting direction etc.	4; high-speed counters (each 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 2 incremental encoders with 2 pulse series offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl. calling subroutine with any content) on reaching setpoint; change counting direction etc.	4; high-speed counters (each 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 2 incremental encoders with 2 pulse series offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl. calling subroutine with any content) on reaching setpoint; change counting direction etc.	4; high-speed counters (each 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 2 incremental encoders with 2 pulse series offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl. calling subroutine with any content) on reaching setpoint; change 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	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges
Number of pulse outputs	2; 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
Isolation				
Isolation, digital outputs				
• between the channels	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Relay
• between the channels, in groups of	4		6	3
Galvanic isolation, digital inputs				
• between the channels	Yes	Yes	Yes	Yes
• between the channels, in groups of			4	4

■ **Technical specifications** (continued)

	6ES7 211-0AA23-0XB0	6ES7 211-0BA23-0XB0	6ES7 212-1AB23-0XB0	6ES7 212-1BB23-0XB0
Permissible potential difference				
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
Environmental requirements				
Environmental conditions	For further environmental conditions, see "Automation System S7-200, System Manual"	For further environmental conditions, see "Automation System S7-200, System Manual"	For further environmental conditions, see "Automation System S7-200, System Manual"	For further environmental conditions, see "Automation System S7-200, System Manual"
Operating termperature				
• 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%	5%	5%	5%
• Operation, max.	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2
Degree and class of protection				
• IP 20	Yes	Yes	Yes	Yes
Dimensions and weight				
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

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Supply voltages						
Rated value						
• DC 24 V	Yes		Yes		Yes	
• permissible range, lower limit (DC)	20.4 V		20.4 V		20.4 V	
• permissible range, upper limit (DC)	28.8 V		28.8 V		28.8 V	
• 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
Voltages and currents						
Load voltage L+						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	5 V	20.4 V	5 V	20.4 V	5 V
• permissible range, upper limit (DC)	28.8 V	30 V	28.8 V	30 V	28.8 V	30 V

SIMATIC S7-200
Central processing units

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

■ Technical specifications (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Load voltage L1						
• Rated value (AC)		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC		100 V; 100 to 230 V AC
• permissible range, lower limit (AC)		5 V		5 V		5 V
• permissible range, upper limit (AC)		250 V		250 V		250 V
• permissible frequency range, lower limit		47 Hz		47 Hz		47 Hz
• permissible frequency range, upper limit		63 Hz		63 Hz		63 Hz
Current consumption						
Inrush current, max.	12 A; at 28.8 V	20 A; at 264 V	12 A; at 28.8 V	20 A; at 264 V	10 A; at 28.8 V	20 A; at 264 V
from supply voltage L+, max.	700 mA; 110 to 700 mA, output current for expansion modules (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 (DC 5 V) 600 mA		220 mA; 35 to 100 mA (240 V), 70 to 220 mA (120 V); output current for expansion modules (DC 5 V) 600 mA		320 mA; 40 to 160 mA (240 V), 80 to 320 mA (120 V); output current for expansion modules (DC 5 V) 1000 mA
Backup battery						
• Backup time, max.	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module
Memory						
Memory						
• 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	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. - Program memory, max.	8 KByte 12 KByte; 8 KB on active run-time edit	8 KByte 12 KByte; 8 KB on active run-time edit	10 KByte 16 KByte; 12 KB for active run-time edit	10 KByte 16 KByte; 12 KB for active run-time edit	10 KByte 24 KByte; 16 KB with active run-time edit	10 KByte 24 KByte; 16 KB with active run-time edit

■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Backup						
• present	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering	Yes; Program: complete program maintenance-free in integral EEPROM, programmable via CPU; Data: entire DB1 loaded by PG/PC maintenance-free in integrated EEPROM, current values of the DB 1 in the RAM, retentive memory bits, times, counters etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering
CPU/processing times						
for bit operations, max.	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs	0.22 µs
Times/counters and their remanence						
S7 counter						
• Number	256	256	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	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery
- lower limit	1	1	1	1	1	1
- upper limit	256	256	256	256	256	256
• Counting range						
- lower limit	0	0	0	0	0	0
- upper limit	32,767	32,767	32,767	32,767	32,767	32,767
S7 times						
• Number	256	256	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	Yes; via high-performance capacitor or battery	Yes; via high-performance capacitor or battery
- upper limit	64	64	64	64	64	64
• Time range						
- lower limit	1 ms	1 ms	1 ms	1 ms	1 ms	1 ms
- upper limit	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min	54 min; 4 times, 1 ms to 30 s 16 times, 10 ms to 5 min 236 times, 100 ms to 54 min

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Central processing units

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

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■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Data areas and their remanence						
Flag						
• Number, max.	32 Byte	32 Byte	32 Byte	32 Byte	32 Byte	32 Byte
• Remanence available	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7	Yes; M0.0 to M31.7
• of which 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	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	0 to 112 in EEPROM, adjustable	0 to 112 in EEPROM, adjustable
Hardware configuration						
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
Expansion devices, max.	7; Only expansion modules of the S7-22x series may be used (due to limited output current, the use of expansion modules may be subject to restrictions.)					
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; two on board inputs and one output, in addition; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	38; two on board inputs and one output, in addition; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)	35; max. 28 inputs and 7 outputs (EM) or max. 0 inputs and 14 outputs (EM)
• Digital inputs/outputs, max.	168; max. 94 inputs and 74 outputs (CPU+EM)	168; max. 94 inputs and 74 outputs (CPU+EM)	168; max. 94 inputs and 74 outputs (CPU+EM)	168; max. 94 inputs and 74 outputs (CPU+EM)	148; max. 128 inputs and 120 outputs (CPU+EM)	148; max. 128 inputs and 120 outputs (CPU+EM)
• AS interface inputs/outputs max.	62; AS-Interface A/B-slaves (CP 243-2)	62; AS-Interface A/B-slaves (CP 243-2)	62; AS-Interface A/B-slaves (CP 243-2)	62; AS-Interface A/B-slaves (CP 243-2)	62; AS-Interface A/B-slaves (CP 243-2)	62; AS-Interface A/B-slaves (CP 243-2)
Connection point						
pluggable I/O terminals	Yes	Yes	Yes	Yes	Yes	Yes
1st interface						
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
Physics	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 a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter					

■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
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
• 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
2nd interface						
Type of interface			Integated RS 485 interface	Integated RS 485 interface	Integated RS 485 interface	Integated 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 a freely programmable interface with an interrupt option for serial data transmission with external units with ASCII protocol baud rates: 0.3/0.6/1.2/2.4/4.8/9.6/19.2/38.4 kbit/s; at 1.2 to 38.4 kbit/s, the PC/PPI cable can be used as an RS232/RS485 converter			
MPI						
• Transmission speed, max.			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
CPU/programming						
Programming language						
• LAD	Yes	Yes	Yes	Yes	Yes	Yes
• FUP	Yes	Yes	Yes	Yes	Yes	Yes
• AWL	Yes	Yes	Yes	Yes	Yes	Yes
Operational stocks	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, integer math instructions, floating-point math instructions, numeric functions, move instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions					
User program protection/password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection	Yes; 3-stage password protection
Program processing	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)	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	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	1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer
Number of subroutines, max.	64	64	64	64	64	64

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Central processing units

■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Digital inputs						
Number of digital inputs	14	14	14	14	24	24
Cable length						
• Cable length, shielded, max.	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m	500 m; Standard input: 500m, fast counter: 50m
• 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	300 m; not for high-speed signals	300 m; not for high-speed signals
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
Input voltage						
• Rated value, DC	24 V	24 V	24 V	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	0 to 5 V; 0 to 1V (I0.3 to I0.5)	0 to 5 V; 0 to 1V (I0.3 to I0.5)	0 to 5 V	0 to 5 V
• for signal "1"	min. 15 V	min. 15 V	min. 15 V; at least 4V (I0.3 to I0.5)	min. 15 V; at least 4V (I0.3 to I0.5)	min. 15 V	min. 15 V
Input current						
• for signal "1", typ.	2.5 mA	2.5 mA	2.5 mA; 8 mA for I0.3 to I0.5	2.5 mA; 8 mA for I0.3 to I0.5	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)						
• for standard inputs - programmable - at " to "1", min. - at "0" to "1", max.	Yes; all 0.2 ms 12.8 ms	Yes; all 0.2 ms 12.8 ms	Yes; all 0.2 ms 12.8 ms	Yes; all 0.2 ms 12.8 ms	Yes; all 0.2 ms 12.8 ms	Yes; all 0.2 ms 12.8 ms
• for interrupt inputs - programmable	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3	Yes; E0.0 to E0.3
• 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) 30 kHz	Yes; (E0.0 to E1.5) 30 kHz

■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Digital outputs						
Number of digital outputs	10; Transistor	10; Relay	10; Transistor	10; Relay	16; Transistor	16; Relay
Cable length, shielded, max.	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
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
Limitation of inductive shutdown voltage to	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	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	200 W; 30 W DC, 200 W AC
Output voltage						
• for signal "1", min.	20 V DC	L+/L1	L+ minus 0.4 V (5V/20.4V for A0.0 to A0.4; 20.4 V A0.5 to A1.1)	L+/L1	20 V DC	L+/L1
Output current						
• for signal "1" rated value	750 mA	2 A	750 mA	2 A	750 mA	2 A
• for signal "0" residual current, max.	10 μA	0 mA	10 μA	0 mA	10 μA	0 mA
Output delay with resistive load						
• "0" to "1", max.	15 μs; of the standard outputs, max. (A0.2 to A1.1) 2 μs; of the pulse outputs, max. (A0.0 to A0.1) 2 μs	10 ms; all outputs	15 μs; of the standard outputs, max. (A0.2 to A1.1) 15 μs; of the pulse outputs, max. (A0.0 to A0.1) 0.5 μs	10 ms; all outputs	15 μs; of the standard outputs, max. (A0.2 to A1.1) 2 μs; of the pulse outputs, max. (A0.0 to A0.1) 2 μs	10 ms; all outputs
• "1" to "0", max.	130 μs; of the standard outputs, max. (A0.2 to A1.1) 10 μs; of the pulse outputs, max. (A0.0 to A0.1) 10 μs	10 ms; all outputs	130 μs; of the standard outputs, max. (A0.2 to A1.1) 130 μs; of the pulse outputs, max. (A0.0 to A0.1) 1.5 μs	10 ms; all outputs	130 μs; of the standard outputs, max. (A0.2 to A1.1) 10 μs; of the pulse outputs, max. (A0.0 to A0.1) 10 μs	10 ms; all outputs
Parallel switching of 2 outputs						
• for increased power	Yes	No	Yes	No	Yes	No
Switching frequency						
• of the pulse outputs, with resistive load, max.	20 kHz; A0.0 to A0.1	1 Hz	100 kHz; A0.0 to A0.1	1 Hz	20 kHz; A0.0 to A0.1	1 kHz
Aggregate current of the outputs (per group)						
• horizontal installation - up to 55 °C, max.	6 A	10 A	3.75 A	10 A	6 A	10 A
• up to 40 °C, max.	6 A	10 A	3.75 A	10 A	6 A	10 A
Relay outputs						
Number of operating cycles		10,000,000; mechanically 10 million, at rated load voltage 100,000		10,000,000; mechanically 10 million, at rated load voltage 100,000		10,000,000; mechanically 10 million, at rated load voltage 100,000

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Central processing units

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

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■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Analog inputs						
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
Encoder supply						
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: 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 400 mA	Yes; electronic at 400 mA
• Output current, max.	280 mA	280 mA	280 mA	280 mA	400 mA	400 mA
Encoder						
Connectable encoders						
• 2-wire BEROS	Yes	Yes	Yes	Yes	Yes	Yes
• permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA
Integrated Functions						
Number of counters	6; high-speed counters (each 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 4 incremental encoders with 2 pulse series offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl.calling subroutine with any content) on reaching setpoint; change counting direction etc.		6; high-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 2 incremental encoders with 2 pulse series offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl.calling subroutine with any content) on reaching setpoint; change counting direction etc.		6; high-speed counters (each 30 kHz), 32 bit (incl. sign), usable as forward/backward counter or for connection of 4 incremental encoders with 2 pulse series offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; Interrupt options (incl.calling subroutine with any content) on reaching setpoint; change counting direction etc.	
Counter frequency (counter) max.	30 kHz	30 kHz	200 kHz	200 kHz	30 kHz	30 kHz
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges	4; 4 rising edges and/or 4 falling edges
Number of pulse outputs	2; 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	20 kHz	20 kHz
Isolation						
Isolation, digital outputs						
• between the channels	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Relay	Yes; Optocoupler	Yes; Relay
• between the channels, in groups of	5		5			
Galvanic isolation, digital inputs						
• between the channels	Yes	Yes	Yes	Yes	Yes	Yes; Optocoupler
Permissible potential difference						
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

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■ **Technical specifications** (continued)

	6ES7 214-1AD23-0XB0	6ES7 214-1BD23-0XB0	6ES7 214-2AD23-0XB0	6ES7 214-2BD23-0XB0	6ES7 216-2AD23-0XB0	6ES7 216-2BD23-0XB0
Environmental requirements						
Environmental conditions	For further environmental conditions, see "Automation System S7-200, System Manual"					
Operating termperature						
• vertical installation, min.	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
• horizontal installation, min.	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
Air pressure						
• permissible range, min.	860 hPa	860 hPa	860 hPa	860 hPa	860 hPa	860 hPa
• permissible range, max.	1,080 hPa	1,080 hPa	1,080 hPa	1,080 hPa	1,080 hPa	1,080 hPa
Relative humidity						
• Operation, min.	5%	5%	5%	5%	5%	5%
• Operation, max.	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2	95%; RH stressing level 2 in accordance with IEC 1131-2
Degree and class of protection						
• IP 20	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions and weight						
Width	120.5 mm	120.5 mm	140 mm	140 mm	196 mm	196 mm
Height	80 mm	80 mm	80 mm	80 mm	80 mm	80 mm
Depth	62 mm	62 mm	62 mm	62 mm	62 mm	62 mm
Weights						
Weight, approx.	360 g	410 g	390 g	440 g	550 g	660 g

SIMATIC S7-200
Central processing units

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

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Ordering data		Order No.
CPU 221		
Compact CPU, main memory 4 KB, power supply 24 V DC, 6 DI/4 DO integrated	A)	**6ES7 211-0AA23-0XB0**
Compact CPU, main memory 4 KB, power supply 100 V to 230 V AC, 6 DI/4 DO integrated, relay outputs	A)	**6ES7 211-0BA23-0XB0**
CPU 222		
Compact CPU, expandable, main memory 4 KB, power supply 24 V DC, 8 DI/6 DO integrated	A)	**6ES7 212-1AB23-0XB0**
Compact CPU, expandable, main memory 4 KB, power supply 100 V to 230 V AC, 8 DI/6 DO integrated, relay outputs	A)	**6ES7 212-1BB23-0XB0**
CPU 224		
Compact CPU, expandable, main memory 8/12 KB program, 8 KB data, power supply 24 V DC, 14 DI/10 DO integrated	A)	**6ES7 214-1AD23-0XB0**
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	A)	**6ES7 214-1BD23-0XB0**
CPU 224 XP		
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	A)	**6ES7 214-2AD23-0XB0**
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	A)	**6ES7 214-2BD23-0XB0**
CPU 226		
Compact CPU, expandable, main memory 16/24 KB program, 10 KB data, power supply 24 V DC, 24 DI/16 DO integrated	A)	**6ES7 216-2AD23-0XB0**
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	A)	**6ES7 216-2BD23-0XB0**
S7-200 True Power Box		
Complete package, comprising CPU 222, STEP 7 Micro/WIN V4, simulator, intelligent USB/PPI multi-master cable, manual; delivered in a practical box		
German	C)	**6ES7 298-0AA20-0AA3**
English	C)	**6ES7 298-0AA20-0BA3**

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

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

		Order No.
MC 291 memory module, EEPROM		
for CPU 221/222//224/224 XP/226		
64 KB	A)	**6ES7 291-8GF23-0XA0**
256 KB	A)	**6ES7 291-8GH23-0XA0**
Grounding clamp		**6ES5 728-8MA11**
10 units		
Front flap set	A)	**6ES7 291-3AX20-0XA0**
contains various cover flaps for CPUs and EMs; spare part		
SIM 274 simulator (optional)		
with 8 terminals for CPU 221/222	A)	**6ES7 274-1XF00-0XA0**
with 14 terminals for CPU 224/ 224 XP	A)	**6ES7 274-1XH00-0XA0**
with 24 terminals for CPU 226	A)	**6ES7 274-1XK00-0XA0**
Pluggable terminal block (spare part)		
With 12 terminals (for CPU 22x)	A)	**6ES7 292-1AE20-0AA0**
With 18 terminals (for CPU 224/ 224 XP)	A)	**6ES7 292-1AG20-0AA0**
With 14 terminals (for CPU 226)	A)	**6ES7 292-1AF20-0AA0**
Intelligent RS 232/PPI multi-master cable	A)	**6ES7 901-3CB30-0XA0**
For connecting devices with an RS 232 interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network		
Intelligent USB/PPI multi-master cable	A)	**6ES7 901-3DB30-0XA0**
For connecting devices with an USB interface to SIMATIC S7-200 or the PPI network; master in the multi-master PPI network		
MPI cable		**6ES7 901-0BF00-0AA0**
5 m; for connecting the S7-200 to MPI		
Backplane bus expansion cable	A)	**6ES7 290-6AA20-0XA0**
For interconnection of the two rows of modules with double-tier configuration, for CPU 222/224/224 XP/226		
Optional battery module	A)	**6ES7 291-8BA20-0XA0**
Optional combined clock and battery module	A)	**6ES7 297-1AA23-0XA0**
only for CPU 221/222		

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■ Ordering data	Order No.			Order No.
S7-200 programmable controller, System Manual			**STEP 7-Micro/WIN V4 programming software**	
for CPU 221/222/224/224 XP/226 and STEP 7 Micro/Win V4			*Target system*: All CPUs of the SIMATIC S7-200 *Prerequisite:* Windows 2000/XP on programming device or PC *Type of delivery:* German, English, French, Spanish, Italian, Chinese; with online documentation	
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**		Single license E)	**6ES7 810-2CC03-0YX0**
Chinese	**6ES7 298-8FA24-8FH0**		Upgrade Single License[1)] E)	**6ES7 810-2CC03-0YX3**
SIMATIC Manual Collection D)	**6ES7 998-8XC01-8YE0**		**PROFIBUS bus connector, IP 20 with 90° cable outlet**	
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			• Without PG connection	**6ES7 972-0BA12-0XA0**
			• With PG connection	**6ES7 972-0BB12-0XA0**
			PROFIBUS bus connector, IP 20 with 35° cable outlet	
			• Without PG connection	**6ES7 972-0BA41-0XA0**
SIMATIC Manual Collection update service for 1 year D)	**6ES7 998-8XC01-8YE2**		• With PG connection	**6ES7 972-0BB41-0XA0**
Current "Manual Collection" DVD and the three subsequent updates			**PROFIBUS FC standard cable**	**6XV1 830-0EH10**
			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	
			RS 485 repeater for PROFIBUS	**6ES7 972-0AA01-0XA0**

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

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

E) 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

3

■ Overview SIPLUS CPU 221

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

	SIPLUS CPU 221	
Order No.	**6AG1 211-0AA23-2XB0**	**6AG1 211-0BA23-2XB0**
Order No. based on	**6ES7 211-0AA23-0XB0**	**6ES7 211-0BA23-0XB0**
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 (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules.	

■ Overview SIPLUS CPU 222

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

	SIPLUS CPU 222	
Order No.	**6AG1 212-1AB23-2XB0**	**6AG1 212-1BB23-2XB0**
Order No. based on	**6ES7 212-1AB23-0XB0**	**6ES7 212-1BB23-0XB0**
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 (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1).	Yes	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules.	

■ **Overview SIPLUS CPU 224**

- The compact high-performance CPU
- With 24 inputs/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 to +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Ambient conditions	Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules..	

■ **Overview SIPLUS CPU 224 XP**

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

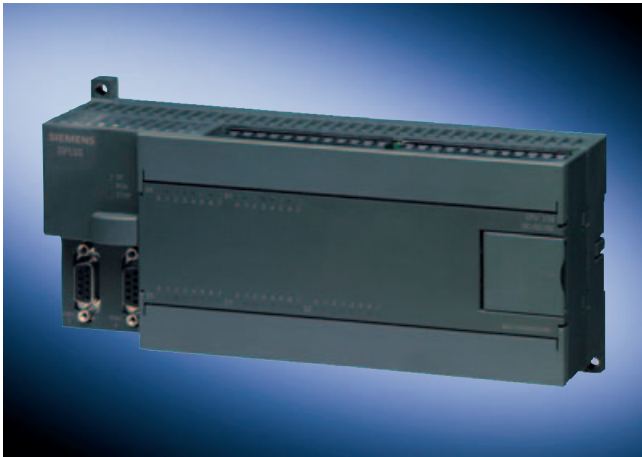|	SIPLUS CPU 224 XP	
Order No.	**6AG1 214-2AD23-2XB0**	**6AG1 214-2BD23-2XB0**
Order No. based on	**6ES7 214-2AD23-0XB0**	**6ES7 214-2BD23-0XB0**
Ambient temperature range	-25 to +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible	
Ambient conditions	Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	No	No
Approvals	CE	
Technical data	The technical data are identical with the technical data 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 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

	SIPLUS CPU 226	
Order No.	**6AG1 216-2AD23-2XB0**	**6AG1 216-2BD23-2XB0**
Order No. based on	**6ES7 216-2AD23-0XB0**	**6ES7 216-2BD23-0XB0**
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 (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules.	

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Ordering data		Order No.		Order No.

SIPLUS CPU 221

(extended temperature range and medial load)

Compact CPU, main memory 4 KB, power supply 24 V DC, 6 DI/4 DO integrated	A)	**6AG1 211-0AA23-2XB0**
Compact CPU, main memory 4 KB, power supply 100 V to 230 V AC, 6 DI/4 DO integrated, relay outputs	A)	**6AG1 211-0BA23-2XB0**

SIPLUS CPU 222

(extended temperature range and medial load)

Compact CPU, expandable, main memory 4 KB, power supply 24 V DC, 8 DI/6 DO integrated	A)	**6AG1 212-1AB23-2XB0**
Compact CPU, expandable, main memory 4 KB, power supply 100 V to 230 V AC, 8 DI/6 DO integrated, relay outputs	A)	**6AG1 212-1BB23-2XB0**

SIPLUS CPU 224

(extended temperature range and medial load)

Compact CPU, expandable, main memory 8/12 KB program, 8 KB data, power supply 24 V DC, 14 DI/10 DO integrated	A)	**6AG1 214-1AD23-2XB0**
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	A)	**6AG1 214-1BD23-2XB0**

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

SIPLUS CPU 224 XP

(extended temperature range and medial load)

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 12/16 KB program, 10 KB data, power supply 100 V to 230 V AC, 14 DI/10 DO (relay outputs)/ 2 AI/1 AO integrated	A)	**6AG1 214-2BD23-2XB0**

SIPLUS CPU 226

(extended temperature range and medial load)

Compact CPU, expandable, main memory 16/24 KB program, 10 KB data, power supply 24 V DC, 24 DI/16 DO integrated	A)	**6AG1 216-2AD23-2XB0**
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	A)	**6AG1 216-2BD23-2XB0**

Accessories	see central processig units SIMATIC S7-200, page 3/20

SIMATIC S7-200
Digital modules

Digital modules

■ **Overview**

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

■ **Technical specifications EM 221**

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
Current consumption			
from backplane bus DC 5 V, max.	70 mA	30 mA	30 mA
Power loss, typ.	3 W	2 W	3 W
Connection point			
pluggable I/O terminals	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	16	8	8
Cable length			
• Cable length, shielded, max.	500 m	500 m	500 m
• Cable length unshielded, max.	300 m	300 m	300 m
m/p-reading	Yes	Yes	
Input characteristic curve to IEC 1131, Typ 1	Yes		Yes
Input voltage			
• Rated value, AC			230 V; AC 220/230 V (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
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
• permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA
Isolation			
Galvanic isolation, digital inputs			
• galvanic isolation, digital inputs	Yes	Yes	Yes
• between the channels, in groups of	4	4	1; (8 groups)

■ **Technical specifications EM 221** (continued)

	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0	6ES7 221-1EF22-0XA0
Dimensions and weight			
Width	71.2 mm	46 mm	71.2 mm
Height	80 mm	80 mm	80 mm
Depth	62 mm	62 mm	62 mm
Weights			
Weight, approx.	160 g	150 g	160 g

■ **Technical specifications EM 222**

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0
Voltages and currents		
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
Current consumption		
Digital outputs		
from backplane bus DC 5 V, max.	40 mA	50 mA
Power loss, typ.	3 W	2 W
Connection point		
pluggable I/O terminals	Yes	Yes
Digital outputs		
Number of digital outputs	4	8
Cable length, shielded, max.	500 m	500 m
Cable length unshielded, max.	150 m	150 m
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)
Output voltage		
• for signal "1", min.	DC 20 V	20 V
Output current		
• 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
Parallel switching of 2 outputs		
• for increased power		Yes
Aggregate current of the outputs (per group)		
• 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
Relay outputs		
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
Isolation		
Isolation, digital outputs		
• Galvanic isolation, digital outputs	Yes	Yes
• between the channels, in groups of	1	4

SIMATIC S7-200
Digital modules

Digital modules

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■ **Technical specifications EM 222** (continued)

	6ES7 222-1BD22-0XA0	6ES7 222-1BF22-0XA0	
Dimensions and weight			
Width	45 mm	45 mm	
Height	80 mm	80 mm	
Depth	62 mm	62 mm	
Weights			
Weight, approx.	120 g	150 g	

	6ES7 222-1HD22-0XA0	6ES7 222-1HF22-0XA0	6ES7 222-1EF22-0XA0
Voltages and currents			
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
Current consumption			
Digital outputs			
• from load voltage L+, max.	80 mA; 20 mA per switched output	72 mA; 9 mA per switched output	
from backplane bus DC 5 V, max.	30 mA	40 mA	110 mA
Power loss, typ.	4 W	2 W	4 W
Connection point			
pluggable I/O terminals	Yes	Yes	Yes
Digital outputs			
Number of digital outputs	4; Relay	8; Relay	8
Cable length, shielded, max.	500 m	500 m	500 m
Cable length unshielded, max.	150 m	150 m	150 m
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 S7-200")
Output voltage			
• for signal "1", min.			L1 (-0.9 V)
Output current			
• 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
Aggregate current of the outputs (per group)			
• 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
Relay outputs			
Number of operating cycles	30,000,000; mechanically 30 million, at rated load voltage 30,000	10,000,000; mechanically 10 million, at rated load voltage 100,000	

■ **Technical specifications EM 222** (continued)

	6ES7 222-1HD22-0XA0	6ES7 222-1HF22-0XA0	6ES7 222-1EF22-0XA0
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; 30/200 W (DC/AC)	60 W
• with resistive load, max.	10 A	2 A	0.5 A
Isolation			
Isolation, digital outputs			
• Galvanic isolation, digital outputs	Yes	Yes	Yes
• between the channels, in groups of	1; 4 groups	4	1; 8 groups
Dimensions and weight			
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
Voltages and currents			
Load voltage L+			
• Rated value (DC)	24 V	24 V	24 V
• permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V
• permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V
Current consumption			
from backplane bus DC 5 V, max.	40 mA	80 mA	160 mA
Power loss, typ.	2 W	3 W	6 W
Connection point			
pluggable I/O terminals	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	4	8	16
Input voltage			
• Rated value, DC	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 bis 5 V	0 bis 5 V
• for signal "1"	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
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
Digital outputs			
Number of digital outputs	4	8	16
Cable length, shielded, max.	500 m	500 m	500 m
Cable length unshielded, max.	150 m	150 m	150 m
Short-circuit protection of the output	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)

SIMATIC S7-200
Digital modules

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■ **Technical specifications EM 223** (continued)

	6ES7 223-1BF22-0XA0	6ES7 223-1BH22-0XA0	6ES7 223-1BL22-0XA0
Output voltage			
• for signal "0" (DC), max.	0.1 V	0.1 V	0.1 V
• for signal "1", min.	20 V	20 V	20 V
Output current			
• for signal "1" rated value	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
Relay outputs			
Switching capacity of the contacts			
• with inductive load, max.	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
• with resistive load, max.	0.75 A; each output	0.75 A; each output	0.75 A; each output
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
• permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA
Isolation			
Isolation checked with	AC 500 V	AC 500 V	AC 500 V
Isolation			
Isolation, digital outputs			
• Galvanic isolation, digital outputs	Yes	Yes	Yes
• between the channels, in groups of	4	4	4; 4 / 4 / 8
Galvanic isolation, digital inputs			
• galvanic isolation, digital inputs	Yes	Yes	Yes
• between the channels, in groups of	4	4	4
Dimensions and weight			
Width	46 mm	71.2 mm	137.5 mm
Height	80 mm	80 mm	80 mm
Depth	62 mm	62 mm	62 mm
Weights			
Weight, approx.	160 g	200 g	360 g

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0
Voltages and currents			
Load voltage L+			
• Rated value (DC)	24 V	24 V	24 V
• permissible range, lower limit (DC)	5 V	5 V	5 V
• permissible range, upper limit (DC)	30 V	30 V	30 V
Load voltage L1			
• Rated value (AC)	230 V; 24 to 230 V AC	230 V; 24 to 230 V AC	230 V; 24 to 230 V AC
• permissible range, lower limit (AC)	5 V	5 V	5 V
• permissible range, upper limit (AC)	250 V	250 V	250 V
Current consumption			
from backplane bus DC 5 V, max.	40 mA	80 mA	150 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"
from sensor current supply or external current supply (DC 24 V), max.	72 mA	72 mA	72 mA
Power loss, typ.	2 W	3 W	6 W

■ **Technical specifications EM 223** (continued)

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0
Connection point			
pluggable I/O terminals	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	4	8	16
Input voltage			
• Rated value, DC	24 V	24 V	24 V
• for signal "0"	0 to 5 V	0 to 5 V	0 to 5 V
• for signal "1"	15 to 30 V DC	15 to 30 V DC	15 to 30 V DC
Input current			
• for signal "1", typ.	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
Digital outputs			
Number of digital outputs	4; Relay	8; Relay	16; Relay
cable length, shielded, max.	500 m	500 m	500 m
Cable length unshielded, max.	150 m	150 m	150 m
Short-circuit protection of the output	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
• for signal "1", min.	L+/L1	L+/L1	L+/L1
Output current			
• for signal "1" rated value	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
Relay outputs			
Number of operating cycles	10.000.000; mechanically 10 million, at rated load voltage 100,000	10.000.000; mechanically 10 million, at rated load voltage 100,000	10.000.000; mechanically 10 million, at rated load voltage 100,000
Switching capacity of the contacts			
• with inductive load, max.	0.75 A; each output	0.75 A; each output	0.75 A; each output
• on lamp load, max.	200 W; 30/200 W (DC/AC)	200 W; 30/200 W (DC/AC)	200 W; 30/200 W (DC/AC)
• with resistive load, max.	0.75 A; each output	0.75 A; each output	0.75 A; each output
Encoder			
Connectable encoders			
• 2-wire BEROS	Yes	Yes	Yes
• permissible quiescent current (2-wire BEROS), max.	1 mA	1 mA	1 mA
Isolation			
Isolation checked with	AC 500 V	AC 500 V	AC 500 V
Isolation			
Isolation, digital outputs			
• Galvanic isolation, digital outputs	Yes	Yes	Yes
• between the channels, in groups of	4	4	4
Galvanic isolation, digital inputs			
• galvanic isolation, digital inputs	Yes	Yes	Yes
• between the channels, in groups of	4	4	8

SIMATIC S7-200
Digital modules

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<div style="background:blue">Digital modules</div>

Technical specifications EM 223 (continued)

	6ES7 223-1HF22-0XA0	6ES7 223-1PH22-0XA0	6ES7 223-1PL22-0XA0
Dimensions and weight			
Width	46 mm	71,2 mm	137,5 mm
Height	80 mm	80 mm	80 mm
Depth	62 mm	62 mm	62 mm
Weights			
Weight, approx.	160 g	300 g	400 g

Ordering data

	Order No.
Digital input module EM 221	
For CPU 221/222/224/224 XP/226	
• 8 inputs, 24 V DC, galvanically A) isolated, source/sink switching	**6ES7 221-1BF22-0XA0**
• 16 inputs, 24 V DC, galvanically A) isolated, source/sink switching	**6ES7 221-1BH22-0XA0**
• 8 inputs, 120/230 V AC, galvani-A) cally isolated, source/sink switching	**6ES7 221-1EF22-0XA0**
Digital output module EM 222	
For CPU 221/222/224/224 XP/226	
• 4 outputs, 24 V DC; 5 A, A) galvanically isolated	**6ES7 222-1BD22-0XA0**
• 8 outputs, 24 V DC; 0.75 A, A) galvanically isolated	**6ES7 222-1BF22-0XA0**
• 4 outputs, 24 V DC/24 V AC up A) to 230 V; 10 A, galvanically isolated, relay outputs	**6ES7 222-1HD22-0XA0**
• 8 outputs, 24 V DC/24 V AC up A) to 230 V; 2 A, galvanically isolated, relay outputs	**6ES7 222-1HF22-0XA0**
• 8 outputs, AC 120/230 V; 0.5 A, A) galvanically isolated	**6ES7 222-1EF22-0XA0**
Digital input/output module EM 223	
For CPU 221/222/224/224 XP/226	
• 4 inputs 24 V DC, A) 4 outputs 24 V DC; 0.75 A, galvanically isolated	**6ES7 223-1BF22-0XA0**
• 8 inputs 24 V DC, A) 8 outputs 24 V DC; 0.75 A, galvanically isolated	**6ES7 223-1BH22-0XA0**
• 16 inputs 24 V DC, A) 16 outputs 24 V DC; 0.75 A, galvanically isolated	**6ES7 223-1BL22-0XA0**
• 4 inputs 24 V DC, A) 4 outputs, relay	**6ES7 223-1HF22-0XA0**
• 8 inputs 24 V DC, A) 8 outputs, relay	**6ES7 223-1PH22-0XA0**
• 16 inputs 24 V DC, A) 16 outputs, relay	**6ES7 223-1PL22-0XA0**

	Order No.
Front flap set	
contains different covering flaps A) for CPU and EM; Spare part	**6ES7 291-3AX20-0XA0**
Plug-in terminal block (spare part)	
• with 7 connection terminals A) (for EM 221/222)	**6ES7 292-1AD20-0AA0**
• with 12 connection terminals A) (for EM 223)	**6ES7 292-1AE20-0AA0**
SIM 274 simulator (optional)	
with 8 connection terminals A) 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**

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

Overview

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

SIPLUS EM 221 digital input modules for CPU 22x

	8 DI	16 DI
Order No.	6AG1 221-1BH22-2XA0	6AG1 221-1BF22-2XB0
Order No. based on	6ES7 221-1BH22-0XA0	6ES7 221-1BF22-0XA0
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 (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules.	

SIPLUS EM 222 digital output modules for CPU 22x

	8 DO	8 RO
Order No.	6AG1 222-1BF22-2XB0	6AG1 222-1HF22-2XB0
Order No. based on	6ES7 222-1BF22-0XB0	6ES7 222-1HF22-0XB0
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 (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules.	

SIMATIC S7-200
SIPLUS digital modules

SIPLUS digital modules

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■ **Overview** (continued)

SIPLUS EM 223 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 to +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible		
Ambient conditions	Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres).		
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes	Yes
Approvals	CE, cUL		
Technical data	The technical data are identical with the technical data of the based on modules.		

SIPLUS EM 223 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 to +70 °C; -25 to +55 °C (for applications with cUL approval), condensation permissible		
Ambient conditions	Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres).		
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes	Yes	Yes
Approvals	CE, cUL		
Technical data	The technical data are identical with the technical data of the based on modules.		

■ **Ordering data**   **Order No.**   **Order No.**

Digital input module SIPLUS EM 221		Digital input/output module SIPLUS EM 223	
(extended temperature range and medial load)		(extended temperature range and medial load)	
For CPU 221/222/224/224 XP/226		For CPU 221/222/224/224 XP/226	
• 8 inputs, 24 V DC, galvanically isolated, source/sink switching	A) **6AG1 221-1BF22-2XB0**	• 4 inputs 24 V DC, 4 outputs 24 V DC; 0.75 A, galvanically isolated	A) **6AG1 223-1BF22-2XB0**
• 16 inputs, 24 V DC, galvanically isolated, source/sink switching	A) **6AG1 221-1BH22-2XA0**	• 8 inputs 24 V DC, 8 outputs 24 V DC; 0.75 A, galvanically isolated	A) **6AG1 223-1BH22-2XB0**
Digital output module SIPLUS EM 222		• 16 inputs 24 V DC, 16 outputs 24 V DC; 0.75 A, galvanically isolated	A) **6AG1 223-1BL22-2XB0**
(extended temperature range and medial load)		• 4 inputs 24 V DC, 4 outputs, relay	A) **6AG1 223-1HF22-2XB0**
For CPU 221/222/224/224 XP/226		• 8 inputs 24 V DC, 8 outputs, relay	A) **6AG1 223-1PH22-2XB0**
• 8 outputs, 24 V DC; 0.75 A, galvanically isolated	A) **6AG1 222-1BF22-2XB0**	• 16 inputs 24 V DC, 16 outputs, relay	A) **6AG1 223-1PL22-2XB0**
• 8 outputs, 24 V DC/24 V AC up to 230 V; 2 A, galvanically isolated, relay outputs	A) **6AG1 222-1HF22-2XB0**	**Accessories**	see digital modules S7-200, page 3/32

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

◼ Overview

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

◼ Technical specifications EM 231

	6ES7 231-0HC22-0XA0
Current consumption	
from load voltage L+ (without load), max.	60 mA
from backplane bus DC 5 V, max.	20 mA
Power loss, typ.	2 W
Connection point	
pluggable I/O terminals	No
Analog inputs	
Number of analog inputs	4; Difference
Cable length, shielded, max.	100 m; to the sensor
permissible input frequency for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	32 mA
Input ranges (rated values), voltages	
• 0 to +5 V	Yes
• 0 to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Characteristic linearization	
• for voltage measurement	No
• for current measurement	No
Temperature compensation	
• programmable	No

	6ES7 231-0HC22-0XA0
Displayable conversion value range	
• bipolar signals	-32,000 to +32,000
• unipolar signals	0 to 32000
Errors/accuracies	
Interference voltage suppression for $f = n \times (fl +/- 1 \%)$, fl = interference frequency	
• common mode voltage, max.	12 V
Analog value creation	
Integrations and conversion time/resolutionper channel	
• Resolution with overload area (bit including sign), max.	12 Bit
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
• Conversion time (per channel)	250 µs
Isolation	
Isolation, analog inputs	
• Isolation, analog inputs	No
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	183 g

SIMATIC S7-200
Analog modules

Analog modules

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■ Technical specifications EM 232

	6ES7 232-0HB22-0XA0		6ES7 232-0HB22-0XA0
Current consumption		Displayable conversion value range	
from backplane bus DC 5 V, max.	20 mA	• bipolar signals	-32.000 to +32.000
from sensor current supply or external current supply (DC 24 V), max.	70 mA	• unipolar signals	0 to 32.000
		Errors/accuracies	
Power loss, typ.	2 W	Operational limit in overall temperature range	
Connection point		• Voltage, relative to output area	+/- 2 %
pluggable I/O terminals	No	• Current, relative to output area	+/- 2 %
Analog outputs		Basic error limit (operational limit at 25 °C)	
Number of analog outputs	2	• Voltage, relative to output area	+/- 0.5 %
Output ranges, voltage		• Current, relative to output area	+/- 0.5 %
• -10 to +10 V	Yes	**Isolation**	
Output ranges, current		Isolation, analog outputs	
• 4 to 20 mA	Yes	• Galvanic isolation, analog outputs	No
Load impedance (in rated range of output)		**Dimensions and weight**	
• with voltage outputs, min.	5 kΩ	Width	46 mm
• with current outputs, max.	0,5 kΩ	Height	80 mm
Analog value creation		Depth	62 mm
Integrations and conversion time/resolutionper channel		**Weights**	
• Resolution (incl. overload area)	U/12 bit, I/11 bit	Weight, approx.	148 g
Settling time			
• for voltage output	100 µs		
• for current output	2 ms		

■ Technical specifications EM 235

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

Technical specifications EM 235 (continued)

	6ES7 235-0KD22-0XA0
Analog outputs	
Number of analg 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 kΩ
• with current outputs, max.	0,5 kΩ
Analog value creation	
Integrations and conversion time/resolutionper 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 µs
• for current output	2 ms
Displayable conversion value range	
• bipolar signals	-32,000 to +32,000
• unipolar signals	0 to 32,000
Errors/accuracies	
Operational limit in overall temperature range	
• Voltage, relative to output area	+/- 2 %
• Current, relative to output area	+/- 2 %
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 x (fl +/- 1 %), fl = interference frequency	
• common mode voltage, max.	12 V
Isolation	
Isolation, analog outputs	
• Galvanic isolation, analog outputs	No
Isolation, analog inputs	
• Isolation, analog inputs	No
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	186 g

Ordering data | Order No.

EM 231 analog input module	A)	**6ES7 231-0HC22-0XA0**
For CPU 222/224/224 XP/226; 4 inputs , 0 - 10 V, 12-bit resolution		
EM 232 analog output module	A)	**6ES7 232-0HB22-0XA0**
For CPU 222/224/224 XP/226; 2 outputs, ± 10 V, 12-bit resolution		
EM 235 analog input/output module	A)	**6ES7 235-0KD22-0XA0**
For CPU 222/224/224 XP/226; 4 inputs, 1 output, ±10 V DC, 12-bit resolution		
Grounding terminal		**6ES5 728-8MA11**
10 items		
Front flap set		
contains different covering flaps for CPU and EM; Spare part	A)	**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**

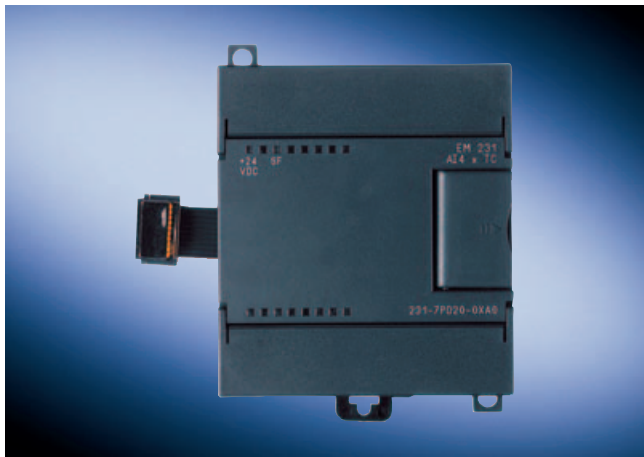A) Subject to export regulations: AL: N and ECCN: EAR99H

SIMATIC S7-200
Analog modules

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EM 231 thermocouple module

■ Overview

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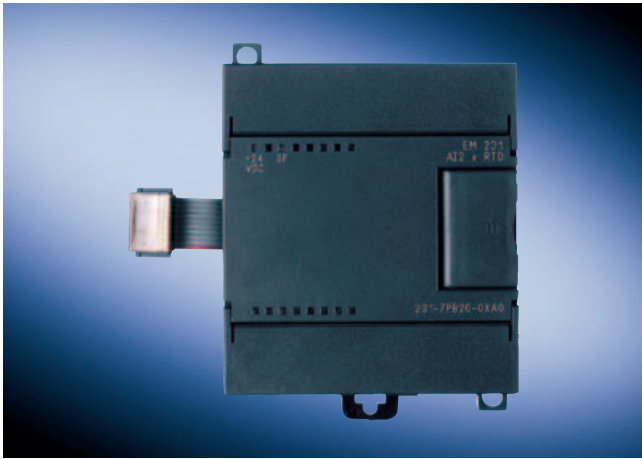- Easy to install in an existing system

■ Technical specifications

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

	6ES7 231-7PD22-0XA0
Integrations and conversion time/resolution per channel	
• Resolution with overload area (bit including sign), max.	16 Bit; Temperature 0.1 °C / 0.1 °F
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz
Displayable conversion value range	
• bipolar signals	-27,648 to +27,648
Errors/accuracies	
cold connection point	+/-1.5 °C
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %
Operational limit in overall temperature range	
• Voltage, relative to output area	+/- 0.1 %
Interference voltage suppression for f = n x (fl +/- 1 %), fl = interference frequency	
• common mode voltage, max.	120 V; AC
• common mode voltage, min.	120 dB; at 120 V AC
Isolation	
Isolation, analog inputs	
• Isolation, analog inputs	Yes
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	210 g

■ Ordering data

	Order No.
EM 231 thermocouple modules A)	**6ES7 231-7PD22-0XA0**
4 inputs +/- 80 mV, 15-bit resolution + sign, thermocouples type J, K, S, T, R, E, N	
Grounding terminal	**6ES5 728-8MA11**
10 items	
Backplane bus expansion cable A)	**6ES7 290-6AA20-0XA0**
for connecting the two equipment tiers in a two-tier configuration, for CPU 222/224/224 XP/226	
S7-200 programmable controller, system manual	see analog modules, page 3/37
for CPU 221/222/224/224 XP/226 and STEP 7-Micro/Win V4	

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

■ Overview

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

■ Technical specifications

	6ES7 231-7PB22-0XA0
Current consumption	
from load voltage L+ (without load), max.	60 mA
from backplane bus DC 5 V, max.	87 mA
Power loss, typ.	1.8 W
Connection point	
pluggable I/O terminals	No
Analog inputs	
Number of analog inputs	2
Cable length, shielded, max.	100 m; to the sensor
permissible input frequency for voltage input (destruction limit), max.	30 V; 30 V DC (probe), 5 V DC (source)
Loop resistance cable	20 Ω; max. 2.7 Ohm for Cu
Updating time (all channels)	405 ms; 700 ms at Pt 10000
Input ranges (rated values), resistors	
• 0 to 150 Ohm	Yes
• 0 to 300 Ohm	Yes
• 0 to 600 Ohm	Yes
Input ranges (rated values), resistance thermometers	
• Cu 10	Yes
• Ni 10	Yes
• Ni 1000	Yes
• Ni 120	Yes
• Pt 100	Yes
• Pt 1000	Yes
• Pt 10000	Yes
• Pt 200	Yes
• Pt 500	Yes

	6ES7 231-7PB22-0XA0
Analog value creation	
Measurement principle	Sigma-Delta
Integrations and conversion time/resolutionper channel	
• Resolution with overload area (bit including sign), max.	16 Bit; Temperature 0.1 °C / 0.1 °F
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz
Displayable conversion value range	
• bipolar signals	-27,648 to +27,648
Errors/accuracies	
Repeat accuracy in settled status at 25 °C (relative to input area)	+/- 0.05 %
Operational limit in overall temperature range	
• Voltage, relative to output area	+/- 0.1 %
Interference voltage suppression for $f = n \times (f1 +/- 1\%)$, fl = interference frequency	
• common mode voltage, max.	0 V
• common mode voltage, min.	120 dB; at 120 V AC
Isolation	
Isolation, analog inputs	
• Isolation, analog inputs	Yes
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	210 g

SIMATIC S7-200
Analog modules

EM 231 RTD module

■ **Ordering data**

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

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

Overview SIPLUS analog modules

- 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 modules for the CPU 22x

	4 AI
Order No.	6AG1 231-0HC22-2XB0
Order No. based on	6ES7 231-0HC22-0XA0
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 (for example 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.

SIPLUS EM 232 analog output modules for the CPU 22x

|	2 AO
Order No.	6AG1 232-0HB22-2XB0
Order No. based on	6ES7 232-0HB22-0XA0
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 (for example by chloric and sulphuric atmospheres).
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	No
Approvals	CE, cUL
Technical data	The technical data are identical with the technical data of the based on modules.

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

	4 AI/1 AO
Order No.	6AG1 235-0KD22-2XB0
Order No. based on	6ES7 235-0KD22-0XA0
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 (for example by chloric and sulphuric atmospheres).
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	No
Approvals	CE, cUL
Technical data	The technical data are identical with the technical data of the based on modules.

SIMATIC S7-200
SIPLUS analog modules

SIPLUS analog modules

3

■ **Overview SIPLUS EM 231 RTD module**
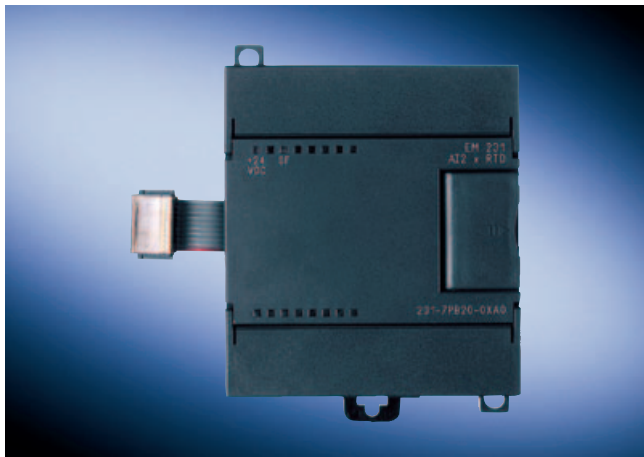
- For user-friendly, high precision temperature detection
- Supports 31 standard resistance temperature sensors
- Easy to install in an existing system

SIPLUS EM 231 RTD modules for CPU 22x

	2 AI Thermo	2 AI Thermo
Order No.	6AG1 231-7PB22-2XA0	6AG1 231-7PB22-2XY0
Order No. based on	6ES7 231-7PB22-0XA0	6ES7 231-7PB22-0XA0
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 (for example by chloric and sulphuric atmospheres).	
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	No	Yes
Approvals	CE, cUL	
Technical data	The technical data are identical with the technical data of the based on modules.	

■ **Ordering data**

	Order No.		Order No.
Analog input module SIPLUS EM 231 A) (extended temperature range and medial load) For CPU 222/224/224 XP/226; 4 inputs , 0 - 10 V, 12-bit resolution	**6AG1 231-0HC22-2XB0**	**SIPLUS EM 231 RTD module** A) (extended temperature range and medial load) 2 inputs for thermistors Pt100/200/500/1000/10000, Ni100/120/1000, Cu10; resistance 150/300/600 Ohms, 15-bit resolution + sign	**6AG1 231-7PB22-2XA0**
Analog output module SIPLUS EM 232 A) (extended temperature range and medial load) For CPU 222/224/224 XP/226; 2 outputs, ± 10 V, 12-bit resolution	**6AG1 232-0HB22-2XB0**	**SIPLUS EM 231 RTD module** A) (extended temperature range and medial load) Conformity with EN 50155; 2 inputs for thermistors Pt100/200/500/1000/10000, Ni100/120/1000, Cu10; resistance 150/300/600 Ohms, 15-bit resolution + sign	**6AG1 231-7PB22-2XY0**
Analog input/output module SIPLUS EM 235 A) (extended temperature range and medial load) For CPU 222/224/224 XP/226; 4 inputs, 1 output, ±10 V DC, 12-bit resolution	**6AG1 235-0KD22-2XB0**	**Accessories**	see analog modules S7-200, pages 3/37, 3/40

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

Overview

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

Technical specifications

	6ES7 253-1AA22-0XA0
Supply voltages	
Rated value	
• permissible range, lower limit (DC)	11 V
• permissible range, upper limit (DC)	30 V
Current consumption	
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
Hardware config.	
Number of modules per CPU	max. 5 with CPU 226/226 XM, max. 3 with CPU 224, max. 1 with CPU 222
Digital inputs	
Number of digital inputs	5
Functions	Stop (STP), reference point switch (RPS), upper limit switch (LMT+), lower limit switch (LMT-), zero point (ZP)
Cable length	
• 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
Type	IEC Type 1, active-high
Input voltage	
• Rated value, DC	24 V
• for signal "0"	STP, RPS, LMT+, LMT- DC 5 V; ZP DC 1 V
• for signal "1"	STP, RPS, LMT+, LMT- DC 15 V; ZP DC 3 V
Input delay (for rated value of input voltage)	
• for standard inputs - programmable	Yes; STP, RPS, LMT+, LMT- 0.2 to 12.8 ms; ZP min 2 µs

	6ES7 253-1AA22-0XA0
Encoder	
Connectable encoders	
• 2-wire BEROS	Yes
• permissible quiescent current (2-wire BEROS), max.	1 mA
Drive interface	
Signal output I	
• Number	4; optionally RS422/RS485 or 5 V DC
• Type	RS422/RS485 (P0+, P0-, P1+, P1-)
• Differential output voltage, min.	2.8 V; RL=200 Ohm
• 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 µs
Isolation	
Galvanic isolation, digital inputs	
• between the channels	Yes
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	190 g

SIMATIC S7-200
Function modules

3

EM 253 positioning module

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

A) 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.

Technical specifications

	SIWAREX MS
Integration in S7-200 automation systems	
• CPU 222 (6ES7212-1*B23-0XB0)	
• CPU 224 (6ES7214-1*D23-0XB0)	
• CPU 224XP (6ES7214-2*D23-0XB0)	
• CPU 226 (6ES7216-2*D23-0XB0)	
Communication interfaces	SIMATIC S7 Bus, RS 232, TTY
Connection of remote indicators (through TTY interface)	Weight value (gross, net)
Adjustment of scales settings	Using PC parameterization software SIWATOOL MS (RS 232)
Measuring properties	
• Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0.05%
• Internal resolution Data format of weight values	65.535 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	
• Weight values	Gross, net
• Limit values	2 (min./max.)
• Zero setting function	Per command
• Tare function	Per command
• Tare specification	Per command
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell powering	
• Supply voltage U_s (rated value)	6 V DC typ.
• Max. supply current	≤ 150 mA
• Permissible load impedance	
- R_{Lmin}	> 40 Ω
- R_{Lmax}	< 4010 Ω
	With SIWAREX IS or SIWAREX Pi Ex interface:
- R_{Lmin}	> 87 Ω
- R_{Lmax}	< 4010 Ω

	SIWAREX MS
Load cell characteristic	1 mV/V to 4 mV/V
Permissible range of measuring signal (at greatest set characteristic)	-2,4 to +26,4 mV
Max. distance of load cells	500 m
Intrinsically-safe load cell supply	
Connection to load cells in Exzone 1	Optionally via SIWAREX IS or SIWAREX Pi Ex interface
Ex approvals and safety	CE, ATEX 100a, FM, UL, cUL$_{US}$ Haz. Loc.
Supply voltage 24 V DC	
• Rated voltage	24 V DC
• Max. current consumption	130 mA
Supply voltage 5 V DC (from CPU)	
• Rated voltage	5 V DC
• Max. current consumption	145 mA
IP degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements $T_{min (IND)}$ to $T_{max (IND)}$) (operating temperature)	
• Vertical installation	0 ... +55 °C
• Horizontal installation	0 ... +40 °C
EMC requirements according to	EN 61326, EN 45501 NAMUR NE21, Part 1

SIMATIC S7-200
Function modules

3

SIWAREX MS

■ Ordering data

	Order No.		Order No.
SIWAREX MS	**7MH4 930-0AA01**	**SIWAREX JB junction box, stainless steel housing**	**7MH4 710-1EA**
Weighing electronics for scales in SIMATIC S7-200 for applications that do not require official calibration		for connecting up to 4 load cells in parallel	
SIWAREX MS Manual		**Ex interface, type SIWAREX Pi**	**7MH4 710-5AA**
• German, English, Italian, Spanish, French		With UL and FM approvals, but **without ATEX approval**	
Free download on the Internet at: www.siemens.com/weighing-technology		for intrinsically safe connection of weighing cells, suitable for weighing modules SIWAREX U, M, FTA, FTC, CS, MS and P. Not approved for use in the EU.	
Configuration package SIWAREX MS on CD-ROM for SIMATIC MicroWIN 32, version 3.2 or higher	**7MH4 930-0AK01**	**Manual for Ex interface type SIWAREX Pi**	**C71000-T5974-C29**
• Software for SIWATOOL MS scale adjustment (German, English, Italian, Spanish, French)		**Ex interface, type SIWAREX IS**	
• Manuals on CD (German/English)		With ATEX approval, but **without UL and FM approvals** for intrinsically safe connection of weighing cells, including manual, suitable for weighing modules SIWAREX U, M, FTA, FTC, CS, MS and P. Suitable for use in the EU.	
• Micro/WIN library MicroScale for communication with SIWAREX MS		• With short-circuit current < 199 mA DC	**7MH4 710-5BA**
SIWAREX MS "Getting started"		• With short-circuit current < 137 mA DC	**7MH4 710-5CA**
Sample software for easy acquaintance with programming of the scale.		**Cable (optional)**	
Free download on the Internet at: www.siemens.com/weighing-technology		**Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath**	**7MH4 702-8AG**
SIWATOOL cable		to connect SIWAREX U, M, P, FTA, FTC, CS, MS and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending is possible, 10.8 mm outer diameter, for ambient temperature –40 to +80 °C	
from SIWAREX M, FTA, FTC, MS with serial PC interface, for 9-pin PC interfaces (RS 232)			
• 2 m long	**7MH4 702-8CA**		
• 5 m long	**7MH4 702-8CB**		
Shield clamps for shield termination	**6ES5 728-8MA11**	**Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath**	**7MH4 702-8AF**
Pack of 10; 1 item required for each shielded cable		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 is possible, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 to +80 °C	
Remote displays (option)			
The digital remote displays can be connected directly to the SIWAREX MS through the TTY interface.			
The following remote display can be used: S102		**Cable LiYCY 4 x 2 x 0.25 mm²** A)	**7MH4 407-8BD0**
Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999		for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	
Internet: http://www.siebert.de			
Detailed information available from manufacturer.			
Accessories			
SIWAREX JB junction box, aluminium housing	**7MH4 710-1BA**		
for connecting up to 4 load cells in parallel, and for connecting several junction boxes			

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

Radio clock module SIPLUS DCF 77

3

■ **Overview**

The sychronisation of the real-time clock for the automation systems SIMATIC S7-200, S7-300 and S7-400 with the official time of day of the time signal transmitter DCF 77 of the Physikalisch-Technische Bundesanstalt Braunschweig is made by this module.

The time receipt occurs via a DCF transmitter (antenna with solid-state) which is connected to the the SIMATIC and SIPLUS PLC via two digital inputs and a software driver included in the scope of supply (function block FB). The function blocks can be downloaded under:
http://www.siemens.com/siplus - Support - Tools & Downloads!

■ **Technical specifications**

Radio clock module SIPLUS DCF 77

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

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

■ **Ordering data**   **Order No.**

Radio clock module SIPLUS DCF 77	A)	**6AG1 057-1AA03-0AA0**
For sychronisation of SIMATIC S7-200, S7-300 and S7-400 with the official time of day of the time signal transmitter DCF77 of the Physikalisch-Technische Bundes-anstalt Braunschweig		

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

SIMATIC S7-200
Communication

Modem EM 241

3

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
Voltages and currents	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Current consumption	
from load voltage L+ (without load), max.	70 mA
from backplane bus DC 5 V, max.	80 mA; from expansion bus
Power loss, typ.	2.1 W
Communication functions	
Bus protocol/transmission protocol	PPI, Modbus
Connection point	
Telephone lines	RJ11 (4 cables, 6 contacts)
Modem	
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
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	190 g

Ordering data

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

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

3

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-xxx**21**-xxxx and higher can be used with CPU

■ Technical specifications

	6ES7 277-0AA22-0XA0
Voltages and currents	
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Current consumption	
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
Power loss, typ.	2.5 W
Hardware config.	
Connectable nodes	TD 200 as of V2.0, OP, TP, PG/PC, S7-300/400, PROFIBUS-DP-Master
Communication functions	
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

	6ES7 277-0AA22-0XA0
Interfaces	
Number of RS 485 interfaces	1
DC 5 V	
• Output current, max.	90 mA
DC 24 V	
• Voltage range	20,4 to 28,8 V
• Output current, max.	120 mA
• Current limiting	0,7 to 2,4 A
Connection point	
pluggable I/O terminals	No
PROFIBUS DP	
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
Dimensions and weight	
Width	71.2 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	175 g

■ Ordering data

		Order No.
EM 277 PROFIBUS DP input module	A)	**6ES7 277-0AA22-0XA0**
for CPU 222/224/224 XP/226, for connecting to PROFIBUS DP (slave) and MPI		

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

3

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-xxx**21**-xxxx and higher can be used with CPU

SIPLUS EM 277 PROFIBUS DP 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 (for example 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.
SIPLUS EM 277 PROFIBUS DP input module A)	**6AG1 277-0AA22-2XA0**
(extended temperature range and medial load)	
for CPU 222/224/224 XP/226, for connecting to PROFIBUS DP (slave) and MPI	

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

Overview

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

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

Technical specifications

	CP 243-2
AS-Interface specification	V 2.1
Interfaces	
• Allocation of analog address space in the PLC	corresponding to two I/O modules (8 DI/8 DO and 8 AI/ 8 AO)
• AS-Interface connection	terminal connection
Current consumption	
• through backplane bus	type. 220 mA for 5 V DC
• via AS-Interface from the AS-Interface shaped cables	max. 100 mA
Power loss	approx. 2 W
Perm. ambient conditions	
• Operating temperature	
- horizontal installation	0 °C … +55 °C
- vertical mounting	0 °C … +45 °C
• Transport/storage temperature	- 40 °C … +70 °C
• Relative humidity	max. 95% at +25 °C
Construction	
• Module format	S7-22x expansion module
• Dimensions (W x H x D) in mm	71.2 x 80 x 62 (H+16 mm with holes for wall mounting)
• Weight	approx. 250 g
• Space requirements	1 slot

Ordering data

	Order No.
CP 243-2 communications processor A)	**6GK7 243-2AX01-0XA0**
For connection of SIMATIC S7-200 (2nd generation) to AS-Interface with bus connector	
Manual for CP 243-2	
Including AS-Interface fundamentals and diskette with program examples paper version	
• German	**6GK7 243-2AX00-8AA0**
• English	**6GK7 243-2AX00-8BA0**
• French	**6GK7 243-2AX00-8CA0**
• Spanish	**6GK7 243-2AX00-8DA0**
• Italian	**6GK7 243-2AX00-8EA0**

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

3

CP 243-1

■ Overview

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

- 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. in SOFTNET-S7) allows PLC data to be further processed in PC applications.
- Module replacement possible without PG

■ Technical specifications

	CP 243-1
Data transmission rate	10/100 Mbit/s autosensing
Interfaces	
• Communication connection, electrical	1 x RJ45 (10/100 Mbit/s; TP)
• Connection for supply voltage	1 x 2-pin terminal block
Supply voltage	24 V DC (±5%)
Current consumption	
• from the backplane bus	55 mA
• from 24 V DC external	60 mA
Power loss at 24 V DC	1.75 W
Perm. ambient conditions	
• Operating temperature	
- horizontal installation	0 °C … +55 °C
- vertical installation	0 °C … +45 °C
• Transport/storage temperature	-40 °C … +70 °C
• Relative humidity	Max. 95% at +25 °C
Construction	
• Dimensions (W x H x D) in mm	71.2 x 80 x 62
• Weight	150 g
Performance data	
S7 communication/ PG communication	
• Number of connections that can be used	8 S7 connections + 1 PG connection
Configuration	With STEP 7-Micro/WIN (V3.2 SP1 or higher)

Ordering data

Ordering data	Order No.		Order No.

CP 243-1 D) **6GK7 243-1EX00-0XE0**
communications processor

for connection of SIMATIC S7-200 to Industrial Ethernet; for S7 communication, PG communication with electronic manual on CD-ROM, German and English, French, Italian, Spanish

SOFTNET-S7 Edition 2005 for Industrial Ethernet **6GK1 704-1CW63-3AA0**

Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 64 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English

SOFTNET-S7 Lean Edition 2005 for Industrial Ethernet **6GK1 704-1LW63-3AA0**

Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 8 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English

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

S7-1613 Edition 2005 **6GK1 716-1CB63-3AA0**

Software for S7 and S5 communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, Windows 2000 Professional/Server; for CP 1613/CP 1613 A2 German/English

STEP 7-Micro/WIN V4 programming software

Target system:
All CPUs of the SIMATIC S7-200
Prerequisite:
Windows 2000/XP on PG or PC
Type of delivery:
German, English, French, Spanish, Italian, Chinese; with online documentation

• Single license E) **6ES7 810-2CC03-0YX0**
• Upgrade Single License[1] E) **6ES7 810-2CC03-0YX3**

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

SIMATIC S7-200
Communication

3

CP 243-1 IT

■ Overview

PN	ISO	TCP/IP	UDP	PG	S7	S5	IT	FTP
		☐		☐	☐		☐	☐

- 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. in SOFTNET-S7) allows PLC data to be further processed in PC applications

■ Technical specifications

	CP 243-1 IT
Data transmisssion rate	10/100 Mbit/s autosensing
Interfaces	
• Communication connection, electrical	1 x RJ45 (10/100 Mbit/s; TP)
• Connection for supply voltage	1 x 2-pin terminal block
Voltage supply	24 V DC (±5%)
Current consumption	
• from the backplane bus	55 mA
• from 24 V DC external	60 mA
Power loss at 24 V DC	1.75 W
Permissible ambient conditions	
• Operating temperature	
- horizontal installation	0 °C … +55 °C
- vertical installation	0 °C … +45 °C
• Transport/storage temperature	-40 °C … +70 °C
• Relative humidity	max. 95% at +25 °C
Design	
• Dimensions (W x H x D) in mm	71.2 x 80 x 62
• Weight	150 g
Performance data	
IT communication	
• Number of connections to an e-mail server	1
• E-mail client:	32 e-mails with max. 1024 characters
• Number of FTP connections	1
• Number of HTTP connections	4
• Programmable access protection	8 users
• Capacity of flash memory file system	8 Mbyte
• Service life of the Flash Memory cells	1000000 write cycles
S7 communication/ PG communication	
• Number of connections that can be used	Eight S7 connections + 1 PG connection
Configuration	With STEP 7-Micro/WIN V3.2 SP3 or higher

▪ Ordering data

	Order No.		Order No.
CP 243-1 IT communications processor D) 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	**6GK7 243-1GX00-0XE0**	**S7-1613 Edition 2005** Software for S7 and S5 communication, incl. PG/OP communication, OPC server and NCM PC; up to 120 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, Windows 2000 Professional/Server; for CP 1613/CP 1613 A2 German/English	**6GK1 716-1CB63-3AA0**
SOFTNET-S7 Edition 2005 for Industrial Ethernet Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 64 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English	**6GK1 704-1CW63-3AA0**	**STEP 7-Micro/WIN V4 programming software** *Target system:* All CPUs of the SIMATIC S7-200 *Prerequisite:* Windows 2000/XP on PG or PC *Type of delivery:* German, English, French, Spanish, Italian, Chinese; with online documentation	
SOFTNET-S7 Lean Edition 2005 for Industrial Ethernet Software for S7 and S5-compatible communication, incl. OPC server, PG/OP communication and NCM PC; up to 8 connections, single license for 1 installation, runtime software, software and electronic manual on CD-ROM, license key on diskette, Class A, for 32-bit Windows XP Professional, 2003 Server, 2000 Professional/Server; German/English	**6GK1 704-1LW63-3AA0**	• Single license E) • Upgrade Single License[1] E)	**6ES7 810-2CC03-0YX0** **6ES7 810-2CC03-0YX3**

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

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

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

SIMATIC S7-200
Communication

MD720-3 GSM/GPRS modem

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■ **Overview**

- GPRS modem for linking SIMATIC S7-200 PLCs over GPRS to a PC control center with SINAUT MICRO SC
- Used for low-cost monitoring and control of simple telecontrol tasks
- Permanent wireless online connection of SIMATIC S7-200 with secure linking over public networks
- Use as GSM modem for teleservice
- Simple startup possible without special knowledge of radio systems

■ **Technical specifications**

	MD 720-3
Data transmission rate	
• RS232	300 bit/s … 57,600 bit/s
• GSM data calls	CSD 9600 bit/s
• GPRS up to 2 uplinks up to 4 downlinks	13.4 kbit … 27 kbit upload gross (modem->Internet) Net approx. 30% less 40 kbit … 54 kbit download gross (Internet -> modem) Net approx. 30% less
Interfaces	
• RS232	1 x 9-pin Sub-D socket
• GSM/GPRS	1 x SMA antenna socket (50 Ohm)
Frequency ranges	850, 900, 1800, 1900 MHz
Transmitted output power	2 W at 850, 900 MHz 1 W at 1800, 1900 MHz
Current consumption	
Send mode	
• at 12 V	430 mA
• at 24 V	140 mA
Receive mode	
• at 12 V	90 mA
• at 24 V	50 mA
Supply voltage	12 … 30 V DC
Power loss	typ. 5 W max. 6.2 W

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

	MD 720-3
Perm. ambient conditions	
• Operating temperature	- 20 °C … +60 °C
• Transport/storage temperature	- 25 °C … +85 °C
• Relative humidity	Max. 95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	22.5 x 99 x 114
• Weight	Approx. 150 g
• Assembly	Standard rail
Degree of protection	IP40
Configuration	AT commands through S7-200 program blocks
National approvals	Current approvals can be found on the Internet at http:/www.siemens.com/ simatic-net/ik-info

■ **Ordering data** / **Order No.**

SINAUT MD720-3	**6NH9 720-3AA0**
GPRS modem for IP-based data transmission over GSM networks, quad band, AT command interface, automatic establishment of GPRS connection, switchable to CSD mode, RS 232, including gender changer for RS 232/PPI adapter; manual on CD-ROM in German, English, Chinese, Russian	

Accessories

ANT 794-4MR antenna	**6NH9 860-1AA0**
Quad band antenna, omnidirectional with 5 m cable	

SINAUT MICRO SC		
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		
• **SINAUT MICRO SC8** connection management for 8 remote stations;	E)	**6NH9 910-0AA10-0AA3**
• **SINAUT MICRO SC64** connection management for 64 remote stations;	E)	**6NH9 910-0AA10-0AA6**
• **SINAUT MICRO SC256** connection management for 256 remote stations;	E)	**6NH9 910-0AA10-0AA8**
SIMATIC S7-200 PC/PPI cable	A)	**6ES7 901-3CB30-0XA0**
Multimaster, for connecting S7-200 to serial PC interface, supports Freeport and GSM modems		

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

■ 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.
ANT794-4MR	**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	
SINAUT MD720-3	**6NH9 720-3AA0**
GPRS modem for IP-based data transmission over GSM networks, quad band, AT command interface, automatic establishment of GPRS connection, switchable to CSD mode, RS 232, including gender changer for RS 232/PPI adapter; manual on CD-ROM in German, English, Chinese, Russian	
SINAUT MICRO SC	
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	
• **SINAUT MICRO SC8** connection management for 8 remote stations;	E) **6NH9 910-0AA10-0AA3**
• **SINAUT MICRO SC64** connection management for 64 remote stations;	E) **6NH9 910-0AA10-0AA6**
• **SINAUT MICRO SC256** connection management for 256 remote stations;	E) **6NH9 910-0AA10-0AA8**

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

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SINAUT MICRO SC

Overview
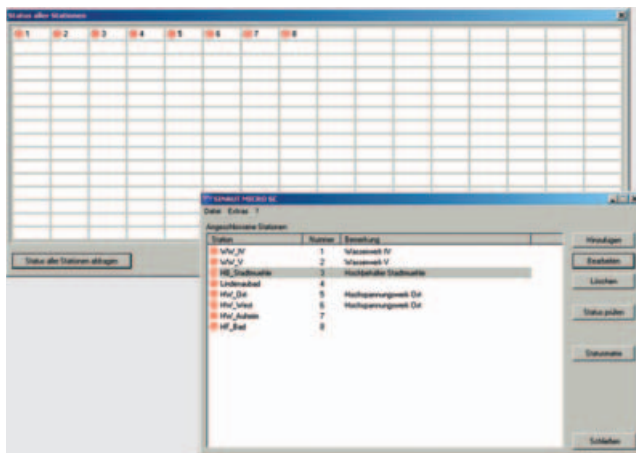
- Software package for PC and SIMATIC S7-200, comprising:
  - *PC:*
    OPC server,
    connection manager
  - *S7-200:*
    PLC block library
- OPC server for GPRS linking as many as 256 SIMATIC S7-200 stations to a control center
- Permanent, bidirectional and wireless online connection to the S7-200 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	DCOM protocol
	OPC "data access interface V2.05"
	Synchronous and asynchronous reading of variables
Interfaces and functions for the SIMATIC S7-200	Writing of variables in the SIMATIC S7 in the case of values changes to OPC variables
	Transfer of SIMATIC S7 data to OPC variables (for event-driven communication from the SIMATIC S7)
	Activatable cyclic reading of variables; adjustable time interval
	Monitoring of connected SIMATIC S7 with time-of-day synchronization
	Routing of data packets between connected SIMATIC S7-200 stations
	Protocol optimized for GRPS; tunnel configuration from GPRS modem
	Via Internet access as server with public IP address (recommendation: fixed public Internet address)
Operating systems	Microsoft Windows XP Professional from Service Pack 2; Microsoft Windows 2003 Server Service Pack 1; Microsoft Windows 2000 Professional/Server Service Pack 4
Diagnostics data	Integral OPC client for connection monitoring
Configuration	Using integral configuration tool

Ordering data

	Order No.
SINAUT MICRO SC	
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	
• **SINAUT MICRO SC8** E) connection management for 8 remote stations;	**6NH9 910-0AA10-0AA3**
• **SINAUT MICRO SC64** E) connection management for 64 remote stations;	**6NH9 910-0AA10-0AA6**
• **SINAUT MICRO SC256** E) connection management for 256 remote stations;	**6NH9 910-0AA10-0AA8**
Accessories	
SINAUT MD720-3	**6NH9 720-3AA0**
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	
ANT 794-4MR antenna	**6NH9 860-1AA0**
Quad band antenna, omnidirectional with 5 m cable	

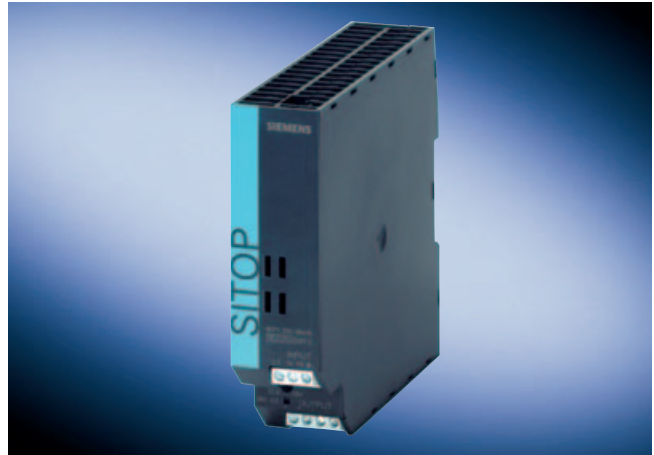E) Subject to export regulations: AL: N and ECCN: EAR99S

■ **Overview**

SITOP 3,5 A, S7-200 design

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.

LOGO!Power 4 A

LOGO!Power supplies are primary switched-mode power supplies that are optimized to the LOGO! logic modules in terms of functionality and design. With the wide input range of 85 V to 264 V AC, radio interference level B and assembly option in built-in miniature distribution boards, they can be used universally in a diverse range of applications in the low-end performance range.

SITOP smart

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 with temporarily up to 150% of the output current excellent overload behavior. Numerous certifications permit universal use around the world.

SIMATIC S7-200
Power supplies

Power supplies

3

■ Technical specifications SITOP power 3.5 A

Power supply, type	3.5 A
Order No.	**6EP1 332-1SH31** [1]
Input	Single-phase AC
Rated voltage $V_{in\ rated}$	**120/230 V AC** Settable using wire jumper
Voltage range	93 to 132 V/187 to 264 V AC
Overvoltage strength	2.3 x $V_{inrated}$, 1.3 ms
Mains buffering $I_{out\ rated}$	> 20 ms at V_{in} = 187 V
Rated line frequency; range	50/60 Hz; 47 to 63 Hz
Rated current $I_{in\ rated}$	1.65/0.95 A
Inrush current limitation (+25 °C)	< 33 A, < 3 ms (V_{in} = 230 V)
I^2t	< 1.0 A^2s
Integrated line-side fuse	T 2.5 A/250 V (not accessible)
Recommended circuit-breaker (IEC 898) in mains supply line	Two-pole circuit-breaker from 10 A, Characteristic C or from 6 A, Characteristic D
Output	Stabilized, floating direct voltage
Rated voltage $V_{out\ rated}$	**24 V DC**
Total tolerance	± 5 % (typ. ± 2 %)
• Stat. mains compensation	Approx. ± 0.1 %
• Stat. load compensation	Approx. ± 0.2 %
Residual ripple (clock frequency: approx. 50 kHz)	< 150 mV_{pp} (typ. 30 mV_{pp})
Spikes (bandwidth: 20 MHz)	< 240 mV_{pp} (typ. 110 mV_{pp})
Setting range	-
Status display	-
Power ON/OFF behavior	No overshoot of V_{out} (soft start)
Starting delay/voltage rise	< 1 s/typ. 80 ms
Rated current $I_{out\ rated}$	**3.5 A**
Current range	
• Up to +45 °C	0 to 3.5 A
• Up to +60 °C	0 to 3.5 A
Dyn. V/I with	
• Starting on short circuit	typ. 5 A for 100 ms
• Short-circuit in operation	typ. 5 A for 100 ms
Parallel connection for increased output	Yes, up to 5
Efficiency	
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$	Approx. 84 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$	Approx. 16 W
Control	
Dyn. mains compensation ($V_{in\ rated}$ ± 15 %)	± 0.3 % V_{out}
Dyn. load compensation (I_{out}: 50/100/50 %)	< ± 10 % V_{out} (typ. ± 3 % V_{out})
Settling time	
• Load step from 50 to 100 %	< 5 ms
• Load step from 100 to 50 %	< 5 ms

Power supply, type	3.5 A
Protection and monitoring	
Output overvoltage protection	
Current limitation	3.8 A
Short-circuit protection	Stabilized current characteristic to typ. 14 V, electronic shutdown below that, automatic restart
RMS sustained short-circuit current	< 4 A
Overload/short-circuit indicator	-
Safety	
Galvanic isolation primary/secondary	Yes, SELV output voltage V_{out} acc. to EN 60950
Protective class	Class I
Discharge current	< 3.5 mA
TÜV test	Yes
CE marking	Yes
UL/cUL (CSA) approval	Yes, cULus listed (UL 508, CSA 22.2 No. 14-M91), File E143289
FM approval	-
Appr. for use in marine vessels	-
Degree of protection (EN 60529)	IP20
EMC	
Interference emission	EN 55022 Class B
Line harmonics limitation	EN 61000-3-2
Interference immunity	EN 61000-6-2
Operating specifications	
Ambient temperature range	0 to +60 °C with natural convection
Transportation and storage temperature range	-25 to +85 °C
Humidity rating	Climatic class 3K3 acc. to EN 60721, no condensation
Mechanical specifications	
Connections	
• Mains input L, N, PE	One screw-type terminal each for 0.5 to 1 mm² finely stranded, 0.5 to 1.5 mm² single-core
• Output L+	1 screw-type terminal for 0.5 to 1 mm²
• Output M	2 screw-type terminals for 0.5 to 1 mm²
Dimensions (W x H x D) in mm	160 x 80 x 62
Weight approx.	0.5 kg
Mounting	Snap-mounting on DIN rail EN 50022-35x15/7.5, wall mounting
Accessories	Mounting bracket

[1] SIPLUS module 6AG1203-1SH31-2AA0 for extended temperature range -25 to + 60 °C and for use under medium loading (e.g. atmospheres containing a high concentration of chlorine and sulphur).

■ **Technical specifications LOGO!Power 4 A**

Type	24 V/4 A
Order number	**6EP1 332-1SH51**
Input	Single-phase AC
Rated voltage $U_{in\,rated}$	**100 V - 240 V AC** wide-range input
Voltage range	85 V to 264 V AC
Overvoltage strength	2.3 x $U_{in\,rated}$/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 $I_{in\,rated}$	1.95 A - 0.97 A
Switch-on current limit (+25 °C)	< 30 A
I^2t	< 2.5 A^2s
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
Output	Controlled, isolated DC voltage
Rated voltage $U_{out\,rated}$	**24 V DC**
Total tolerance, static	±3%
• Static line smoothing	Approx. 0.1%
• Static load smoothing	Approx. 1.5%
Ripple content (clock frequency approx. 90 kHz)	< 200 m V_{pp}
Spikes (bandwidth approx. 20 MHz)	< 300 m V_{pp}
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 $I_{out\,rated}$	**4 A**
Current range up to +55 °C	0 A to 4 A
Parallel switching for enhanced performance	Yes
Efficiency	
Efficiency at $U_{out\,rated}$, $I_{out\,rated}$	Typically. 89%
Heat loss at $U_{out\,rated}$, $I_{out\,rated}$	Typically 12 W
Control	
Dynamic line smoothing ($U_{in\,rated}$ ±15%)	< 0.2% U_{out}
Dynamic load smoothing (I_{out}: 10/90/10%)	±1.5% U_{out}
Setting time	
• 10 at 90%	Typically 20 ms
• 90 at 10%	Typically 20 ms

Type	24 V/4 A
Protection and monitoring	
Current limit	Typically 4.7 A
Short-circuit protection	Constant-current characteristic
Sustained-short-circuit-current rms value	< 10 A
Overload/short-circuit indicator	-
Security	
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
EMC	
Emitted interference	EN 55022 Class B
Supply-harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
Operating data	
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
Mechanical system	
Supply-input connections L1, N	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm²
Connections • Output + • Output -	Per 2 screw-type terminals for 0.5 mm to 2.5 mm²
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

SIMATIC S7-200
Power supplies

Power supplies

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■ Technical specifications SITOP smart

Power supply, type	2.5 A
Order number	**6EP1 332-2BA10**
Input	Single-phase AC
Rated voltage $U_{in\ rated}$	**120/230 V AC** set via change-over switch
Voltage range	85 V to 132 V AC/ 170 V to 264 V AC
Overvoltage strength	2.3 x $U_{in\ rated}$, 1.3 ms
Line buffering at $I_{out\ rated}$	> 20 ms at Uin = 93/187 V
Rated line frequency; rated line-frequency range	50/60 Hz; 47 Hz to 63 Hz
Rated current $I_{in\ rated}$	1.1/0.65 A
Switch-on current limit (+25°C)	< 27 A, typ. 3 ms
I^2t	< 0.3 A^2s
Built-in line-side fuse	T 2 A/250 V (inaccessible)
Recommended miniature circuit-breaker (IEC 898) in the supply feeder	At and above 3 A, C characteristic
Output	Controlled, isolated DC voltage
Rated voltage Uout rated	**24 V DC**
Total tolerance	±3
• Static line smoothing	Approx. 0.1%
• Static load smoothing	Approx. 0.5%
Ripple content (clock frequency: approx. 90 kHz)	< 150 mV_{ss} (typ. 10mV_{ss})
Spikes (bandwidth: 20 MHz)	< 240 mV_{ss} (typ. 50mV_{ss})
Adjustment range	22.8 V to 28.0 V
Operation indicator	24 V OK = green LED
Response on activation/deactivation	Overshoot of U_{out} approx. 4%
Startup delay/voltage rise	< 0.1 s at 230 V AC/typ. 50 ms
Rated current $I_{out\ rated}$	**2.5 A**
Current range	
• Up to +45°C	0 A to 3 A
• Up to +60°C	0 A to 2.5 A
Dynamic U/I at	
• Power-up on short-circuit	Typically 7 A for 100 ms
• Short-circuit during operation	Typically 7 A for 200 ms
Parallel switching for enhanced performance	Yes, 2
Efficiency	
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 85%
Heat loss at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 9 W
Control	
Dynamic line smoothing ($U_{in\ rated}$ ±15%)	Approx. ±0.3% U_{out}
Dynamic load smoothing (I_{out}: 50/100/50%)	±1%U_{out}
Load-step settling time	
• 50 at 100%	Typically 0.2 ms
• 100 at 50%	Typically 0.2 ms

Power supply, type	2.5 A
Protection and monitoring	
Output overvoltage protection	Yes, acc. to EN 60950 (typ. < 45 V)
Current limit	Typically 3.2 A to 3.4 A, overload capability 150% $I_{out\ rated}$ up to 5 s/min
Short-circuit protection	Constant-current characteristic, automatic restart
Sustained-short-circuit-current rms value	Approx. 5 A
Overload/short-circuit indicator	LED off = overload/short-circuit
Security	
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage U_{out} to EN 60950
Protection class (IEC 536; VDE 0106 T1)	Class 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	Yes, cULus-listed (UL 508, CSA 22.2), file E197259, CSA (C22.2 no.14, no.60950-1-03)
Explosion protection	ATEX Directive 94/9/EC; Cat. 3, EEx nC II T4 U
Marine Type Approval	GL
Degree of protection (EN 60 529; VDE 0470 T1)	IP20
EMC	
Emitted interference	EN 55022, Class B
Supply-harmonics limitation	Not applicable
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	0°C to +60°C with natural convection
Transport/storage temperature range	-40°C to +85°C
Humidity class	Climate class 3K3 to EN 60721, no condensation
Mechanical system	
Connections	
• Supply input L, N, PE	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm^2
• Output L+	2 screw-type terminals for 0.5 mm to 2.5 mm^2
• Output M	2 screw-type terminals for 0.5 mm to 2.5 mm^2
Dimensions (W x H x D) in mm	32.5 x 125 x 125
Weight, approx.	0.4 kg
Mounting	Snaps onto DIN rail DIN EN 50022-35 x 15/7.5
Accessories	-

■ **Technical specifications SITOP smart** (continued)

Power supply, type	5 A	5 A
Order number	**6EP1 333-2AA01**	**6EP1 333-2BA01**
Input	Single-phase AC	Single-phase AC
Rated voltage $U_{in\ rated}$	**120/230 V AC** set via change-over switch	**120/230 V AC** set via change-over switch
Voltage range	85 V to 132 V AC/170 V to 264 V AC	85 V to 132 V AC/170 V to 264 V AC
Overvoltage strength	2.3 x $U_{in\ rated}$, 1.3 ms	2.3 x $U_{in\ rated}$, 1.3 ms
Line buffering at $I_{out\ rated}$	> 20 ms at U_{in} = 93/187 V	> 20 ms at U_{in} = 93/187 V
Rated line frequency; rated line-frequency range	50/60 Hz; 47 Hz to 63 Hz	50/60 Hz; 47 Hz to 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^2t	< 0.8 A^2s	< 0.8 A^2s
Built-in line-side fuse	T 3.15 A/250 V (inaccessible)	T 3.15 A/250 V (inaccessible)
Recommended miniature circuit-breaker (IEC 898) in the supply feeder	At and above 6 A, C characteristic	At and above 6 A, C characteristic
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated}$	**24 V DC**	**24 V DC**
Total tolerance	±3%	± 3 %
• Static line smoothing	Approx. 0.1%	Approx. 0.1%
• Static load smoothing	Approx. 0.5%	Approx. 0.5%
Ripple content (clock frequency: approx. 84 kHz)	< 150 mV_{ss} (typ. 50mV_{ss})	< 150 mV_{ss} (typ. 50mV_{ss})
Spikes (bandwidth: 20 MHz)	< 240 mV_{ss} (typ. 150mV_{ss})	< 240 mV_{ss} (typ. 150m_{Vss})
Adjustment range	22.8 V to 28.0 V	22.8 V to 28.0 V
Operation indicator	24 V OK = green LED	24 V OK = green LED
Response on activation/deactivation	Overshoot of U_{out} approx. 4%	Overshoot of U_{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 $I_{out\ rated}$	**5 A**	**5 A**
Current range		
• Up to +45°C	0 A to 6 A	0 A to 6 A
• Up to +60°C	0 A to 5 A	0 A to 5 A
Dynamic U/I at		
• Power-up on short-circuit	Typically 17 A for 100 ms	Typically 17 A for 100 ms
• Short-circuit during operation	Typically 17 A for 200 ms	Typically 17 A for 200 ms
Parallel switching for enhanced performance	Yes, 2	Yes, 2
Efficiency		
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 87%	Approx. 87%
Heat loss at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 17 W	Approx. 17 W
Control		
Dynamic line smoothing (U_{in} rated ±15%)	±0.3% U_{out}	± 0,3 % U_{out}
Dynamic load smoothing (I_{out}: 50/100/50%)	±1% U_{out}	± 1 % U_{out}
Load-step settling time		
• 50 at 100%	• Typically 0.2 ms	Typically 0.2 ms
• 100 at 50%	• Typically 0.2 ms	Typically 0.2 ms

SIMATIC S7-200
Power supplies

Power supplies

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■ **Technical specifications SITOP smart** (continued)

Power supply, type	5 A	5 A
Protection and monitoring		
Output overvoltage protection	Yes, acc. to EN 60950 (typ. < 45 V)	Yes, acc. to EN 60950 (typ. < 45 V)
Current limit	Typically 6.4 A to 6.6 A, overload capability 150% $I_{out\ rated}$ up to 5 s/min	Typically 6.4 A to 6.6 A, overload capability 150% $I_{out\ rated}$ up to 5 s/min
Short-circuit protection	Constant-current characteristic, automatic restart	Constant-current characteristic, automatic restart
Sustained-short-circuit-current rms value	Approx. 10 A	Approx. 10 A
Overload/short-circuit indicator	LED off = overload/short-circuit	LED off = overload/short-circuit
Security		
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage U_{out} to EN 60950	Yes, safety extra-low output voltage U_{out} to EN 60950
Protection class (IEC 536; VDE 0106 T1)	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	Yes, cULus-listed (UL 508, CSA 22.2), file E197259, CSA (C22.2 no.14, no.60950-1-03)	Yes, cULus-listed (UL 508, CSA 22.2), file E197259, CSA (C22.2 no.14, no.60950-1-03)
Explosion protection	ATEX Directive 94/9/EC; Cat. 3, EEx nC II T4 U	ATEX Directive 94/9/EC; Cat. 3, EEx nC II T4 U
Marine Type Approval	GL	GL
Degree of protection (EN 60 529; VDE 0470 T1)	IP20	IP20
EMC		
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
Operating data		
Ambient temperature range	0°C to +60°C with natural convection	0°C to +60°C with natural convection
Transport/storage temperature range	-40°C to +85°C	-40°C to +85°C
Humidity class	Climate class 3K3 to EN 60721, no condensation	Climate class 3K3 to EN 60721, no condensation
Mechanical		
Connections		
• Supply input L, N, PE	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm^2	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm^2
• Output L+	2 screw-type terminals for 0.5 mm to 2.5 mm^2	2 screw-type terminals for 0.5 mm to 2.5 mm^2
• Output M	2 screw-type terminals for 0.5 mm to 2.5 mm^2	2 screw-type terminals for 0.5 mm to 2.5 mm^2
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
Mounting	Snaps onto DIN rail DIN EN 50022-35x15/7.5	Snaps onto DIN rail DIN EN 50022-35x15/7.5
Accessories	-	-

Power supply, type	10 A	10 A
Order number	**6EP1 334-2AA01**	**6EP1 334-2BA01**
Input	Single-phase AC	Single-phase AC
Rated voltage $U_{in\ rated}$	**120/230 V AC** set via change-over switch	**120/230 V AC** set via change-over switch
Voltage range	85 V to 132 V AC/170 V to 264 V AC	85 V to 132 V AC/170 V to 264 V AC
Overvoltage strength	2.3 x $U_{in\ rated}$, 1.3 ms	2.3 x $U_{in\ rated}$, 1.3 ms
Line buffering at $I_{out\ rated}$	> 20 ms at U_{in} = 93/187 V	> 20 ms at U_{in} = 93/187 V

■ **Technical specifications SITOP smart** (continued)

Power supply, type	10 A	10 A
Rated line frequency; rated line-frequency range	50/60 Hz; 47 Hz to 63 Hz	50/60 Hz; 47 Hz to 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^2t	< 3.3 A^2s	< 3.3 A^2s
Built-in line-side fuse	T 6.3 A/250 V (inaccessible)	T 6.3 A/250 V (inaccessible)
Recommended miniature circuit-breaker (IEC 898) in the supply feeder	At and above 10 A, C characteristic	At and above 10 A, C characteristic
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated}$	**24 V DC**	**DC 24 V**
Total tolerance	±3%	± 3 %
• Static line smoothing	Approx. 0.1%	Approx. 0.1%
• Static load smoothing	Approx. 0.5%	Approx. 0.5%
Ripple content (clock frequency: approx. 60 kHz)	< 150 mV$_{ss}$ (typ. 50mV$_{ss}$)	< 150 mV$_{ss}$ (typ. 50mV$_{ss}$)
Spikes (bandwidth: 20 MHz)	< 240 mV$_{ss}$ (typ. 150mV$_{ss}$)	< 240 mV$_{ss}$ (typ. 150mV$_{ss}$)
Adjustment range	22.8 V to 28.0 V	22.8 V to 28.0 V
Operation indicator	24 V OK = green LED	24 V OK = green LED
Response on activation/deactivation	Overshoot of U$_{out}$ approx. 4%	Overshoot of U$_{out}$ 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 $I_{out\ rated}$	**10 A**	**10 A**
Current range		
• Up to +45°C	0 A to 12 A	0 A to 12 A
• Up to +60°C	0 A to 10 A	0 A to 10 A
Dynamic U/I at		
• Power-up on short-circuit	Typically 30 A for 100 ms	Typically 30 A for 100 ms
• Short-circuit during operation	Typically 33 A for 200 ms	Typically 33 A for 200 ms
Parallel switching for enhanced performance	Yes, 2	Yes, 2
Efficiency		
Efficiency at U$_{out\ rated}$, I$_{out\ rated}$	Approx. 90%	Approx. 91%
Heat loss at U$_{out\ rated}$, I$_{out\ rated}$	Approx. 27 W	Approx. 24 W
Control		
Dynamic line smoothing (U$_{in\ rated}$ ±15%)	±0.3% U$_{out}$	±0.3% U$_{out}$
Dynamic load smoothing (I$_{out}$: 50/100/50%)	±1% U$_{out}$	±1% U$_{out}$
Load-step settling time		
• 50 at 100%	Typically 0.2 ms	Typically 0.2 ms
• 100 at 50%	Typically 0.2 ms	Typically 0.2 ms
Protection and monitoring		
Output overvoltage protection	Yes, acc. to EN 60950 (typ. < 45 V)	Yes, acc. to EN 60950 (typ. < 45 V)
Current limit	Typically 12.5 A to 13.5 A, overload capability 150% I$_{out\ rated}$ up to 5 s/min	Typically 12.5 A to 13.5 A, overload capability 150% I$_{out\ rated}$ up to 5 s/min
Short-circuit protection	Constant-current characteristic, automatic restart	Constant-current characteristic, automatic restart
Sustained-short-circuit-current rms value	Approx. 16 A	Approx. 16 A
Overload/short-circuit indicator	LED off = overload/short-circuit	LED off = overload/short-circuit

SIMATIC S7-200
Power supplies

Power supplies

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■ **Technical specifications SITOP smart** (continued)

Power supply, type	10 A	10 A
Security		
Primary/secondary galvanic isolation	Yes, safety extra-low output voltage U_{out} to EN 60950	Yes, safety extra-low output voltage U_{out} to EN 60950
Protection class (IEC 536; VDE 0106 T1)	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 Scheme)	Notified Body (CB Scheme)
CE marking	Yes	Yes
UL/cUL (CSA) approval	Yes, cULus-listed (UL 508, CSA 22.2), file E197259, CSA (C22.2 no.14, no.60950-1-03)	Yes, cULus-listed (UL 508, CSA 22.2), file E197259, CSA (C22.2 no.14, no.60950-1-03)
Explosion protection	ATEX Directive 94/9/EC; Cat. 3, EEx nC II T4 U	ATEX Directive 94/9/EC; Cat. 3, EEx nC II T4 U
Marine Type Approval	GL	GL
Degree of protection (EN 60 529; VDE 0470 T1)	IP20	IP20
EMC		
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
Operating data		
Ambient temperature range	0°C to +60°C with natural convection	0°C to +60°C with natural convection
Transport/storage temperature range	-40°C to +85°C	-40°C to +85°C
Humidity class	Climate class 3K3 to EN 60721, no condensation	Climate class 3K3 to EN 60721, no condensation
Mechanical system		
Connections		
Supply input L, N, PE	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm^2	Solid/finely-stranded per screw-type terminal for 0.5 mm to 2.5 mm^2
Output L+	2 screw-type terminals for 0.5 mm to 2.5 mm^2	2 screw-type terminals for 0.5 mm to 2.5 mm^2
Output M	2 screw-type terminals for 0.5 mm to 2.5 mm^2	2 screw-type terminals for 0.5 mm to 2.5 mm^2
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
Mounting	Snaps onto DIN rail DIN EN 50022-35x15/7.5	Snaps onto DIN rail DIN EN 50022-35x15/7.5
Accessories	-	-

■ **Ordering data**

	Order No.		Order No.
Regulated load current supply SITOP power 3.5 A	6EP1 332-1SH31	**Regulated load current supply SITOP smart**	
120/230 V AC, 24 V DC /3.5 A		120/230 V AC, 24 V DC	
Mounting bracket	6EP1 971-1AA01	2.5 A	**6EP1 332-2BA10**
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	**6EP1 333-2AA01**
		5 A, with restriction of the supply harmonics acc. to EN 61000-3-2	**6EP1 333-2BA01**
		10 A	**6EP1 334-2AA01**
		10 A, with restriction of the supply harmonics acc. to EN 61000-3-2	**6EP1 334-2BA01**
Regulated load current supply LOGO!Power 24 V/4 A	6EP1 332-1SH51		
100 ... 240 V AC, 24 V DC/4 A			

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 272-1BA10-0YA0
Power supply	
Input voltage	
• Rated value (DC)	24 V; Supply from S7-200 communication interface
Input current	
• Rated value at 24 V DC	25 mA
MPI	
Transmission speed (PPI), max.	187.5 kBit/s
1st interface	
Physics	RS 485
Functionality	
• PPI	Yes
PPI	
• Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC

	6ES7 272-1BA10-0YA0
Operator control and monitoring	
Display	
• Type	LC display (reflecting)
• Number of lines	4
• Number of characters per line	12
• Font size	3.34 mm
Environmental requirements	
Operating temperature	
• min.	0 °C
• max.	60 °C
Storage/transport temperature	
• min.	-20 °C
• max.	70 °C
Degree and class of protection	
• IP 65	Yes
Dimensions and weight	
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
Cabinet/switchboard strength	1.5 mm
Weights	
Weight, approx.	120 g

Ordering data

	Order No.
Text Display TD 100C 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	**6ES7 272-1BA10-0YA0**
Connecting cables For connecting TD 100C or TD 200C to S7-200	**6ES7 901-3EB10-0XA0**
Blank film For printing customized keyboard layouts; 6 perforated foils per sheet; 10 sheets per packing unit	**6ES7 272-1BF00-7AA0**
Accessories for supplementary ordering	
Connecting cables	see catalog ST 80
Connectors	see catalog ST 80

SIMATIC S7-200
Human machine interface

Text Display TD 200

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■ 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 272-0AA30-0YA0
Power supply	
Input voltage	
• Rated value (DC)	24 V; Supply through S7-200 communication interface or optional external power supply unit. Sensor power supply (24 V DC) of the CPU is not loaded
Input current	
• Rated value at 24 V DC	120 mA
MPI	
Transmission speed (PPI), max.	187.5 kBit/s
1st interface	
Physical	RS 485
Functionality	
• PPI	Yes
PPI	
• Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC

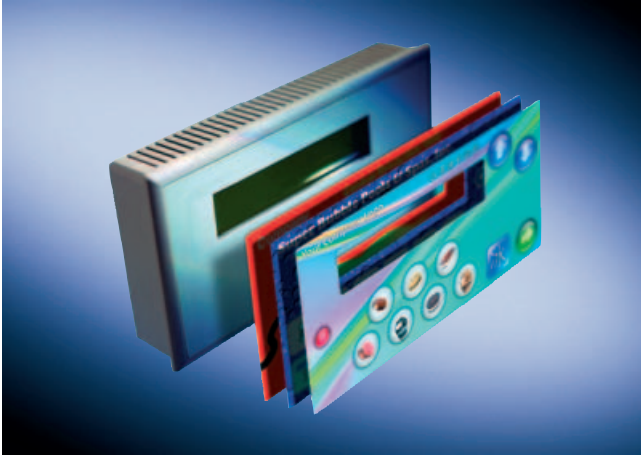|	6ES7 272-0AA30-0YA0
Operator control and monitoring	
Display	
• Type	LCD backlit
• Number of lines	2
• Number of characters per line	20; Chars/line: ASCII, Cyrillic; 10 chars per line: Chinese
• Font size	5 mm
Environmental requirements	
Operating temperature	
• min.	0 °C
• max.	60 °C
Storage/transport temperature	
• min.	-40 °C
• max.	70 °C
Degree and class of protection	
• IP 65	Yes; at front
Dimensions and weight	
Width	148 mm
Height	76 mm
Depth	27 mm
Mounting cutout, width	138 mm
Mounting cutout, height	68 mm
Cabinet/switchboard strength	0.3 mm
Weights	
Weight, approx.	250 g

■ Ordering data

	Order No.
Text Display TD 200	
for connection to SIMATIC S7-200; can be used with STEP 7-Micro/WIN V3.2 SP4 or higher, incl. connecting cable	**6ES7 272-0AA30-0YA0**
Connecting cables	
For connecting TD 100C or TD 200C to S7-200	**6ES7 901-3EB10-0XA0**
Accessories for supplementary ordering	
Connecting cables	see catalog ST 80
Connectors	see catalog ST 80

SIMATIC S7-200
Human machine interface

■ 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 272-1AA10-0YA0
Power supply	
Input voltage	
• Rated value (DC)	24 V; Supply through S7-200 communication interface or optional external power supply unit. Sensor power supply (24 V DC) of the CPU is not loaded
Input current	
• Rated value at 24 V DC	120 mA
MPI	
Transmission speed (PPI), max.	187.5 kBit/s
1st interface	
Physics	RS 485
Functionality	
• PPI	Yes
PPI	
• Number of nodes, max.	126; S7-200, OP, TP, TBP, PG/PC

	6ES7 272-1AA10-0YA0
Operator control and monitoring	
Display	
• Type	LCD backlit
• Number of lines	2
• Number of characters per line	20; Chars/line: ASCII, Cyrillic; 10 chars per line: Chinese
• Font size	5 mm
Environmental requirements	
Operating temperature	
• min.	0 °C
• max.	60 °C
Storage/transport temperature	
• min.	-20 °C
• max.	70 °C
Degree and class of protection	
• IP 65	Yes
Dimensions and weight	
Width	148 mm
Height	76 mm
Depth	28 mm
Mounting cutout, width	138 mm
Mounting cutout, height	68 mm
Cabinet/switchboard strength	0.3 mm
Weights	
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	**6ES7 272-1AA10-0YA0**
Connecting cables	**6ES7 901-3EB10-0XA0**
For connecting TD 100C or TD 200C to S7-200	
Accessories for supplementary ordering	
Connecting cables	see catalog ST 80
Connectors	see catalog ST 80s

SIMATIC S7-200
Human machine interface

SIMATIC TP 177micro

■ Overview

- Touch panel for operator control and monitoring of small machines and plants
- Low-cost starter device in the touch panel class with graphical capability complete with all the basic functions required for simple tasks
- Pixel graphics 5.7" STN touch screen (analog/resistive), Bluemode (4 levels)
- Specifically for SIMATIC S7-200: Communication to the PLC is performed via the integrated interface over a point-to-point connection
- Connected to the PLC via MPI or PROFIBUS DP cable
- The SIMATIC TP 177micro is the redesigned successor to the SIMATIC TP 070/TP 170micro touch panels

■ Technical specifications

	6AV6 640-0CA11-0AX0
Supply voltage	
Supply voltage	24 V DC
Permitted range	+20,4 to +28,8 V DC
Rated current	0.24 A
Memory	
Type	Flash
Memory usable for project data	256 kByte User memory
Time	
Clock	
• Clock	Software clock, not battery backed
Configuration	
Configuration tool	WinCC flexible ES Micro as of Version 2004 SP 1 (must be ordered separately)
Display	
Display type	STN liquid crystal display (LCD), 4 blue scales
Size	5.7"
Resolution (W x H in pixels)	320 x 240
MTBF backlighting (at 25 °C)	approx. 50000 h
Operating mode	
Operating elements	Touch screen
Function keys, programmable	none
System keys	0
Touchscreen	analog, resistive
Numeric/alphabetical input	Yes / Yes
Degree of protection	
Front	IP65, NEMA 4X (when installed)
Rear	IP20
Certifications & Standards	
Certifications	CE, GL, ABS, BV, DNV, LRS, FM Class I Div. 2, UL, CSA, cULus, EX zone 2/22, C-Tick, NEMA 4X
• Ship classification society	Yes

	6AV6 640-0CA11-0AX0
Ambient conditions	
Mounting position	vertical
Maximum permissible angle of incliniation without external ventilation	+/- 35°
Max. relative humidity (in %)	90%
Temperature	
• Operation (vertical installation)	0 to +50°C
• Operation (max. tilt angle)	0 to +40°C
• Transport, storage	-20 to +60°C
Interfaces	
Interfaces	1 x RS485 (max. 0.1875 Mbit/s)
Operating systems	
Operating system	Smart
Processor/hardware	
Processor	ARM
Functionality under WinCC flexible	
Task planner	Yes
Help system	Yes
Status/control	not possible
Message system	
• Number of messages	500
• Bit messages	Yes
• Analog messages	Yes
• Message buffer	Circulating buffer (n x 128 Entries)
Process pictures/number	
• Process images	250
• Tags	250
• Limit values	Yes
• Multiplexing	Yes

Technical specifications (continued)

	6AV6 640-0CA11-0AX0
Image elements	
• Text objects	500 Text elements
• Graphics objects	Bitmaps, Icons, Icon (screen filling), Vector graphic
• Dynamic objects	Bar
Lists	
• Text lists	150
• Graphics lists	100
• Libraries	Yes
Security	
• Number of user groups	1
• Number of users	1
• Passwords exportable	Yes
Data medium support	
• Multi Media Card	No
Logging/printer driver	
• Printer driver	-
Fonts	
• Keyboard fonts	US American (English)
Languages	
• Online languages	5
• Configuration languages	German, English, French, Italian, Spanish, Chinese traditional, Chinese simplified, Danish, Finnish, Greek, Japanese, Korean, Dutch, Norwegian, Polish, Portuguese, Russian, Swedish, Czech, Turkish, Hungarian
• Fonts	WinCC flexible-Standard, Pictographic languages
Transfer (Upload/Download)	
• Transfer of configuration	serial
Process connecting	
• Connection to controller	S7-200, see catalog ST 80, chapter "system interfaces"
Expandability/openness	
• OPP	No
Dimensions	
Front panel W x H (mm)	212 mm x 156 mm
Mounting cutout/depth W x H x D (mm)	198 mm x 142 mm / 45 mm Device depth
Weights	
Weight	0.75 kg

Ordering data — Order No.

|	
SIMATIC TP 177micro F)	**6AV6 640-0CA11-0AX0**
Touch Panel for connection to the SIMATIC S7-200, 5.7" STN display	
TP 177micro starter package F)	**6AV6 650-0DA01-0AA0**
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)	
Configuring	
with SIMATIC WinCC flexible	see section 7, page 7/55
Documentation (to be ordered separately)	
Operating Instructions OP 73micro, TP 177micro	
• German	**6AV6 691-1DF01-0AA0**
• English	**6AV6 691-1DF01-0AB0**
• French	**6AV6 691-1DF01-0AC0**
• Italian	**6AV6 691-1DF01-0AD0**
• Spanish	**6AV6 691-1DF01-0AE0**
User Manual WinCC flexible Micro	
• German	**6AV6 691-1AA01-0AA0**
• English	**6AV6 691-1AA01-0AB0**
• French	**6AV6 691-1AA01-0AC0**
• Italian	**6AV6 691-1AA01-0AD0**
• Spanish	**6AV6 691-1AA01-0AE0**
SIMATIC HMI Manual Collection E)	**6AV6 691-1SA01-0AX0**
Electronic documentation, on DVD	
5 languages (English, French, German, Italian, Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI	
Accessories for supplementary ordering	
Service packages, protective cover, cover foil, adapter, connecting cables, connectors, system interfaces	see catalogs ST 80, CA 01 or in the A&D Mall

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

SIMATIC S7-200
Human machine interface

SIMATIC OP 73micro

3

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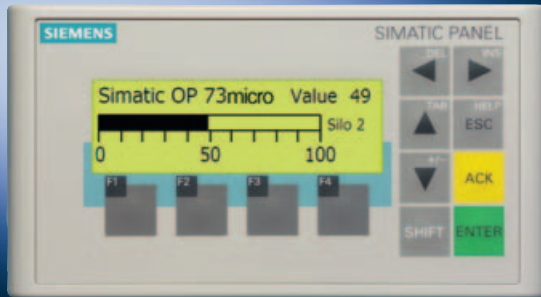
- Operator Panel for controlling and monitoring machines and systems.
- Graphics in a new dimension: small and smart
- Pixel-graphics 3" LCD, monochrome
- 8 system keys, 4 user-configurable function keys
- Specific to the SIMATIC S7-200:
  Communication with the controller takes place via the integrated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

■ Technical specifications

	6AV6 640-0BA11-0AX0
Supply voltage	
Supply voltage	24 V DC
Permitted range	+20.4 bis +28.8 V DC
Rated current	0.1 A
Memory	
Type	Flash
Memory usable for project data	128 kByte User memory
Time	
Clock	
• Clock	Software clock, not battery backed
Configuration	
Configuration tool	WinCC flexible ES Micro as of Version 2004 SP 1 (must be ordered separately)
Display	
Display type	STN liquid crystal display (LCD), Black and white
Size	3 "
Resolution (W x H in pixels)	160 x 48
MTBF backlighting (at 25 °C)	approx. 100000 h
Operating mode	
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	- / - / -
Degree of protection	
Front	IP65, NEMA 4X (when installed)
Rear	IP 20

	6AV6 640-0BA11-0AX0
Certifications & Standards	
Certifications	CE, GL, ABS, BV, DNV, LRS, UL, CSA, cULus, C-Tick, NEMA 4X
• Ship classification society	Yes
Ambient conditions	
Mounting position	vertical
Maximum permissible angle of incliniation without external ventilation	+/- 80°
Max. relative humidity (in %)	90%
Temperature	
• Operation (vertical installation)	0 to +50 °C
• Operation (max. tilt angle)	0 to +40 °C
• Transport, storage	-20 to +60 °C
Interfaces	
Interfaces	1 x RS 485 (max. 0.1875 Mbit/s)
Operating systems	
Operating system	Smart
Processor/hardware	
Processor	ARM
Functionality under WinCC flexible	
Task planner	Yes
Help system	Yes
Status/control	not possible
Message system	
• Number of messages	250
• Bit messages	Yes
• Analog messages	Yes
• Message buffer	Circulating buffer (n x 100 Entries)
Process pictures/number	
• Process images	250
• Tags	500
• Limit values	Yes
• Multiplexing	Yes

■ Technical specifications (continued)

	6AV6 640-0BA11-0AX0
Image elements	
• Text objects	1000 Text elements
• Graphics objects	Bitmaps, Icons, Icon (screen filling)
• Dynamic objects	Bar
Lists	
• Text lists	150
• Graphics lists	0
• Libraries	Yes
Security	
• Number of user groups	1
• Number of users	1
• Passwords exportable	Yes
Data medium support	
• Multi Media Card	No
Logging/printer driver	
• Printer driver	-
Fonts	
• Keyboard fonts	US American (English)
Languages	
• Online languages	5
• Configuration languages	German, English, French, Italian, Spanish, Chinese traditional, Chinese simplified, Danish, Finnish, Greek, Japanese, Korean, Dutch, Norwegian, Polish, Portuguese, Russian, Swedish, Czech, Turkish, Hungarian
• Fonts	WinCC flexible-Standard, Pictographic languages
Transfer (Upload/Download)	
• Transfer of configuration	serial
Process connecting	
• Connection to controller	S7-200, see catalog ST 80, chapter "system interfaces
Expandability/openness	
• OPP	No
Dimensions	
Front panel W x H (mm)	154 mm x 84 mm
Mounting cutout/depth W x H x D (mm)	138 mm x 68 mm / 28.5 mm Device depth
Weights	
Weight	0.25 kg

■ Ordering data

	Order No.
SIMATIC OP 73micro F)	**6AV6 640-0BA11-0AX0**
Operator panel for connection to the SIMATIC S7-200, with 3" display, monochrome incl. mounting accessories	
OP 73micro starter package F)	**6AV6 650-0BA01-0AA0**
Consisting of:	
• OP 73micro Operator Panel	
• SIMATIC WinCC flexible Micro engineering software	
• SIMATIC HMI Manual Collection, 5 languages (English, French, German, Italian, Spanish), comprising: all currently available user manuals, manuals and communication manuals for SIMATIC HMI	
• MPI cable (5 m) (for test purposes)	
Configuring	
with SIMATIC WinCC flexible	see section 7, page 7/55
Documentation (to be ordered separately)	
Operating Instructions OP 73micro/TP 177micro	
• German	**6AV6 691-1DF01-0AA0**
• English	**6AV6 691-1DF01-0AB0**
• French	**6AV6 691-1DF01-0AC0**
• Italian	**6AV6 691-1DF01-0AD0**
• Spanish	**6AV6 691-1DF01-0AE0**
User Manual WinCC flexible Micro	
• German	**6AV6 691-1AA01-0AA0**
• English	**6AV6 691-1AA01-0AB0**
• French	**6AV6 691-1AA01-0AC0**
• Italian	**6AV6 691-1AA01-0AD0**
• Spanish	**6AV6 691-1AA01-0AE0**
SIMATIC HMI Manual Collection E)	**6AV6 691-1SA01-0AX0**
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	
Accessories for supplementary ordering	
Service packages, connecting cables, connectors, system interfaces	see catalogs ST 80, CA 01 or in the A&D Mall

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

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

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

For further information see section 7.

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
Power supply		
Description	from CPU	from USB interface
Protocols		
PPI	Yes; 10/11 bit	Yes; 10/11 bit
ASCII	Yes; Freeport	
MPI		
Transmission speed (PPI), max.	187.5 kBit/s; 9.6 / 19.3 / 187.5 kBits/s; Setting: DIP switch; RS 232 not required	187.5 kBit/s; 9.6 / 19.2 / 187.5 kBits/s; Setting: not required
Status information/ alarms/diagnostics		
Diagnostics indication LED		
• Description	Tx (green): RS-232-transmit indication; Rx (Grün): RS-232-receive indication; PPI (Green): RS-485-transmit indication	Tx (green): USB transmit indication; Rx (Grün): USB receive indication; PPI (Green): RS-485-transmit indication

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

■ Ordering data

		Order No.			Order No.
Intelligent RS 232/PPI multi-master cable	A)	**6ES7 901-3CB30-0XA0**	**Intelligent USB/PPI multi-master cable**	A)	**6ES7 901-3DB30-0XA0**
For connecting devices with an RS 232 interface to SIMATIC S7-200 or PPI network Master in multi-master PPI network			For connecting devices with a USB interface to SIMATIC S7-200 or PPI network; Master in multi-master PPI network		

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

SIPLUS cable 901

3

■ 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

	SIPLUS cable 901
Order No.	6AG1 901-3CB30-2XA0
Order No. based on	6ES7 901-3CB30-0XA0
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 (for example by chloric and sulphuric atmospheres).
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	No
Approvals	CE, cUL
Technical data	The technical data are identical with the technical data of the based on modules.

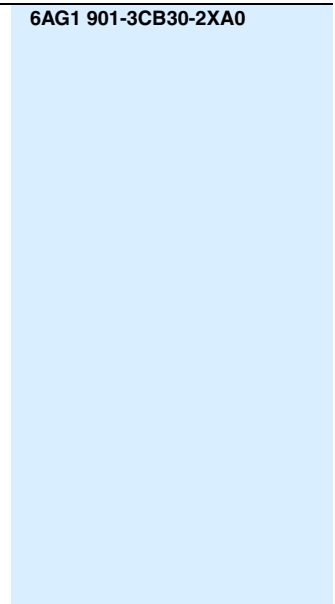## ■ Ordering data   Order No.

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

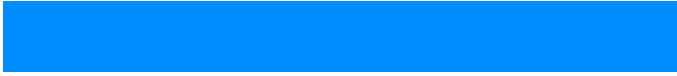(extended temperature range and medial load)

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

SIMATIC S7-200

3