



SIMATIC S7-200, CPU 224XP COMPACT UNIT, DC POWER SUPPLY 14 DI DC/10 DO DC, 2 AI, 1 AO 12/16 KB CODE/10 KB DATA, 2 PPI/FREEPORT PORTS

Supply voltage	
24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>permissible range, lower limit (DC)</li> </ul>	20.4 V
<ul style="list-style-type: none"> <li>permissible range, upper limit (DC)</li> </ul>	28.8 V
Input current	
Inrush current, max.	12 A; at 28.8 V
from supply voltage L+, max.	900 mA; 120 to 900 mA, output current for expansion modules (DC 5 V) 660 mA
Encoder supply	
24 V encoder supply	
<ul style="list-style-type: none"> <li>24 V</li> </ul>	Yes; permissible range: 15.4 to 28.8 V
<ul style="list-style-type: none"> <li>short-circuit protection</li> </ul>	Yes; electronic at 280 mA

• Output current, max.	280 mA
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## Memory

Type of memory	other
Number of memory modules (optional)	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files

### Data and program memory

• Data memory, max.	10 kbyte
• Program memory, max.	16 kbyte; 12 KB with active run-time edit

## Backup

• present	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering
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## Battery

### Backup battery

• Backup time, max.	100 h; (min. 70 h at 40 °C); 200 days (typ.) with optional battery module
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## CPU processing times

for bit operations, max.	0.22 µs
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## Counters, timers and their retentivity

### S7 counter

• Number	256
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#### of which retentive with battery

— can be set	Yes; via high-performance capacitor or battery
— lower limit	1
— upper limit	256

#### Counting range

— lower limit	0
— upper limit	32 767

### S7 times

• Number	256
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#### of which retentive with battery

— can be set	Yes; via high-performance capacitor or battery
— upper limit	64

#### Time range

— lower limit	1 ms
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— upper limit

54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min

## Data areas and their retentivity

Flag	
• Number, max.	32 byte
• Retentivity available	Yes; M 0.0 to M 31.7
• of which retentive with battery	0 to 255, via high-performance capacitor or battery, adjustable
• of which retentive without battery	0 to 112 in EEPROM, adjustable

## Hardware configuration

Expansion devices, max.	7; Only expansion modules of the S7-22x series can be used. Due to the limited output current, the use of expansion modules may be limited.
Connectable programming devices/PCs	SIMATIC PG/PC, standard PC
Expansion modules	
• Analog inputs/outputs, max.	38; 2 onboard inputs and 1 output, also 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)
• AS-Interface inputs/outputs max.	62; AS-Interface A/B slaves (CP 243-2)

## Digital inputs

Number of digital inputs	14
m/p-reading	Yes; optionally, per group
Input voltage	
• Rated value, DC	24 V
• for signal "0"	0 to 5 V; 0 to 1 V (I 0.3 to I 0.5)
• for signal "1"	min. 15 V; min. 4 V (I 0.3 to I 0.5)
Input current	
• for signal "1", typ.	2.5 mA; 8 mA for I 0.3 to I 0.5
Input delay (for rated value of input voltage)	
for standard inputs	
— Parameterizable	Yes; all
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— Parameterizable	Yes; I 0.0 to I 0.3
for counter/technological functions	
— Parameterizable	Yes; (E0.0 to E1.5) up to 200 kHz
Cable length	
• Cable length, shielded, max.	500 m; Standard input: 500 m, high-speed counters: 50 m

- Cable length unshielded, max. 300 m; not for high-speed signals

## Digital outputs

Number of digital outputs	10; Transistor
short-circuit protection	No; to be provided externally
Limitation of inductive shutdown voltage to	1 W
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.75 A
• on lamp load, max.	5 W
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.4 V (5 V / 20.4 V for A 0.0 to A 0.4; 20.4 V A 0.5 to A1.1))
<b>Output current</b>	
• for signal "1" rated value	750 mA
• for signal "0" residual current, max.	10 µA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	15 µs; of the standard outputs, max. (Q0.2 to Q1.1) 15 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 0.5 µs
• "1" to "0", max.	130 µs; of the standard outputs, max. (Q0.2 to Q1.1) 130 µs; of the pulse outputs, max. (Q0.0 to Q0.1) 1.5 µs
<b>Parallel switching of 2 outputs</b>	
• for increased power	Yes
<b>Switching frequency</b>	
• of the pulse outputs, with resistive load, max.	100 kHz; Q0.0 to Q0.1
<b>Aggregate current of outputs (per group)</b>	
all mounting positions	
— up to 40 °C, max.	3.75 A
horizontal installation	
— up to 55 °C, max.	3.75 A
<b>Relay outputs</b>	
• Max. number of relay outputs, integrated	0
<b>Cable length</b>	
• Cable length, shielded, max.	500 m
• Cable length unshielded, max.	150 m

## Analog inputs

Number of analog potentiometers	2; Analog potentiometer; resolution 8 bit
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## Encoder

<b>Connectable encoders</b>	
• 2-wire sensor	Yes

— Permissible quiescent current (2-wire sensor), max.

1 mA

### 1st interface

Interface type	Integrated RS 485 interface
Physics	RS 485
<b>Functionality</b>	
<ul style="list-style-type: none"> <li>• MPI</li> </ul>	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
<ul style="list-style-type: none"> <li>• PPI</li> </ul>	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
<ul style="list-style-type: none"> <li>• Serial data exchange</li> </ul>	Yes; As freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC/PPI cable can also be used as RS232/RS485 converter
<b>MPI</b>	
<ul style="list-style-type: none"> <li>• Transmission rate, min.</li> </ul>	19.2 kbit/s
<ul style="list-style-type: none"> <li>• Transmission rate, max.</li> </ul>	187.5 kbit/s

### 2nd interface

Interface type	Integrated RS 485 interface
Physics	RS 485
<b>Functionality</b>	
<ul style="list-style-type: none"> <li>• MPI</li> </ul>	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
<ul style="list-style-type: none"> <li>• PPI</li> </ul>	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
<ul style="list-style-type: none"> <li>• Serial data exchange</li> </ul>	Yes; As freely programmable interface with interrupt facility for serial data exchange with third-party devices with ASCII protocol transfer rates: 1.2 / 2.4 / 4.8 / 9.6 / 19.2 / 38.4 / 57.6 / 115.2 kbit/s; the PC/PPI cable can also be used as RS232/RS485 converter
<b>MPI</b>	
<ul style="list-style-type: none"> <li>• Transmission rate, min.</li> </ul>	19.2 kbit/s
<ul style="list-style-type: none"> <li>• Transmission rate, max.</li> </ul>	187.5 kbit/s

### Integrated Functions

Number of counters	6; High-speed counters (2 to 200 kHz and 4 to 30 kHz), 32 bits (incl. sign), can be used as up/down counters or for connecting incremental encoders with 2 pulse trains offset by 90° (max. 1 to 100 kHz and 3 to 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.
Counter frequency (counter) max.	200 kHz
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges
Number of pulse outputs	2; High-speed outputs, 20 kHz, with interrupt option; pulse-width and frequency modulation option
Limit frequency (pulse)	20 kHz

### Galvanic isolation

Galvanic isolation digital inputs	
• between the channels	Yes
• between the channels, in groups of	6 and 8
Galvanic isolation digital outputs	
• between the channels	Yes; Optocoupler
• between the channels, in groups of	5

### Permissible potential difference

between different circuits	500 V DC between 24 V DC and 5 V DC
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### Degree and class of protection

Degree of protection to EN 60529	
• IP20	Yes

### Ambient conditions

Environmental conditions	For further environmental conditions, see "Automation System S7-200, System Manual"
Operating temperature	
• horizontal installation, min.	0 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	0 °C
• vertical installation, max.	45 °C
Air pressure	
• permissible range, min.	860 hPa
• permissible range, max.	1 080 hPa
Relative humidity	
• Operation, min.	5 %
• Operation, max.	95 %; RH class 2 in accordance with IEC 1131-2

Configuration	
programming	
<ul style="list-style-type: none"> <li>• Command set</li> <li>• Program processing</li> <li>• Program organization</li> <li>• Number of subroutines, max.</li> </ul>	Bit logic instructions, compare instructions, timer instructions, counter instructions, clock instructions, transmissions instructions, table instructions, logic instructions, shift and rotate instructions, conversion instructions, program control instructions, interrupt and communications instructions, logic stack instructions, integer maths, floating-point math instructions, numerical functions  free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)  1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer  64
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
Know-how protection	
<ul style="list-style-type: none"> <li>• User program protection/password protection</li> </ul>	Yes; 3-stage password protection
Connection method	
Plug-in I/O terminals	Yes
Dimensions	
Width	140 mm
Height	80 mm
Depth	62 mm
Weights	
Weight, approx.	390 g
<b>last modified:</b>	30.09.2014