

SIMATIC S7-200, CPU 221 Compact unit, AC power supply 6 DI  
DC/4 DO Relay outputs, 4 KB progr./2 KB data



Figure similar

Supply voltage	
Rated value (AC)	
• 120 V AC	Yes
• 230 V AC	Yes
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	5 V
• permissible range, upper limit (DC)	30 V
Load voltage L1	
• Rated value (AC)	100 V; 100 V AC to 230 V AC
• permissible range, lower limit (AC)	5 V
• permissible range, upper limit (AC)	250 V
• permissible frequency range, lower limit	47 Hz
• permissible frequency range, upper limit	63 Hz
Input current	
Inrush current, max.	20 A; at 264 V

from supply voltage L1, max.	120 mA; 15 to 60 mA (240 V); 30 to 120 mA (120 V); output current for expansion modules (5 V DC) 340 mA
<b>Encoder supply</b>	
24 V encoder supply	
<ul style="list-style-type: none"> <li>• 24 V</li> <li>• Short-circuit protection</li> <li>• Output current, max.</li> </ul>	<p>Yes; Permissible range: 20.4V to 28.8V</p> <p>Yes; electronic at 600 mA</p> <p>180 mA</p>
<b>Power loss</b>	
Power loss, typ.	6 W
<b>Memory</b>	
Number of memory modules (optional)	1; pluggable memory module, content identical with integral EEPROM; can additionally store recipes, data logs and other files
<b>Work memory</b>	
<ul style="list-style-type: none"> <li>• integrated (for program)</li> <li>• integrated (for data)</li> </ul>	<p>4 kbyte</p> <p>2 kbyte</p>
<b>Backup</b>	
<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes; Program: Entire program maintenance-free on integral EEPROM, programmable via CPU; data: Entire DB 1 loaded from PG/PC maintenance-free on integral EEPROM, current values of DB 1 in RAM, retentive memory bits, timers, counters, etc. maintenance-free via high-performance capacitor; optional battery for long-term buffering
<b>Battery</b>	
Backup battery	
<ul style="list-style-type: none"> <li>• Backup time, max.</li> </ul>	50 h; (min. 8 h at 40 °C); 200 days (typ.) with optional battery module
<b>CPU processing times</b>	
for bit operations, max.	0.22 µs
<b>Counters, timers and their retentivity</b>	
S7 counter	
<ul style="list-style-type: none"> <li>• Number</li> </ul>	256
Retentivity	
— adjustable	Yes; via high-performance capacitor or battery
— lower limit	1
— upper limit	256
Counting range	
— lower limit	0
— upper limit	32 767
S7 times	
<ul style="list-style-type: none"> <li>• Number</li> </ul>	256
Retentivity	

— adjustable	Yes; via high-performance capacitor or battery
— upper limit	64
<b>Time range</b>	
— lower limit	1 ms
— upper limit	54 min; 4 timers: 1 ms to 30 s; 16 timers: 10 ms to 5 min; 236 timers: 100 ms to 54 min

### Data areas and their retentivity

<b>Flag</b>	
• 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

connectable programming devices/PCs	SIMATIC PG/PC, standard PC
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### Digital inputs

Number of digital inputs	6; Integrated
Source/sink input	Yes; optionally, per group

<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	0 to 5 V
• for signal "1"	min. 15 V

<b>Input current</b>	
• for signal "1", typ.	2.5 mA

<b>Input delay (for rated value of input voltage)</b>	
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; (E 0.0 to E 0.5) 30 kHz

<b>Cable length</b>	
• shielded, max.	500 m; Standard input: 500 m, high-speed counters: 50 m
• unshielded, max.	300 m; not for high-speed signals

### Digital outputs

Number of digital outputs	4; Relays
Short-circuit protection	No; to be provided externally
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	2 A

• on lamp load, max.	30 W with DC, 200 W with AC
<b>Output voltage</b>	
• for signal "1", min.	L+/L1
<b>Output current</b>	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	10 ms; all outputs
• "1" to "0", max.	10 ms; all outputs
<b>Parallel switching of two outputs</b>	
• for uprating	No
<b>Total current of the outputs (per group)</b>	
all mounting positions	
— up to 40 °C, max.	6 A
horizontal installation	
— up to 55 °C, max.	6 A
<b>Relay outputs</b>	
• Number of relay outputs, integrated	4
• Number of operating cycles, max.	10 000 000; mechanically 10 million, at rated load voltage 100 000
<b>Cable length</b>	
• shielded, max.	500 m
• unshielded, max.	150 m

## Analog inputs

Number of analog potentiometers	1; Analog potentiometer; resolution 8 bit
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## Encoder

### Connectable encoders

• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1 mA

## 1. Interface

Interface type	Integrated RS 485 interface
Physics	RS 485
<b>Functionality</b>	
• 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

<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 kbps; the PC/PPI cable can also be used as RS 232/RS 485 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
<b>Integrated Functions</b>	
Number of counters	4; High-speed counters (30 kHz each), 32 bits (incl. sign), can be used as up/down counters or for connecting 2 incremental encoders with 2 pulse trains offset by 90° (max. 20 kHz (A/B counters)); parameterizable enable and reset input; interrupt facilities (incl. call of subroutine with any content) when the setpoint is reached; reversal in counting direction, etc.
Counting frequency (counter) max.	30 kHz
Number of alarm inputs	4; 4 rising edges and/or 4 falling edges
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
<ul style="list-style-type: none"> <li>between the channels</li> </ul>	Yes
<ul style="list-style-type: none"> <li>between the channels, in groups of</li> </ul>	2 and 4
<b>Potential separation digital outputs</b>	
<ul style="list-style-type: none"> <li>between the channels</li> </ul>	Yes; Relays
<ul style="list-style-type: none"> <li>between the channels, in groups of</li> </ul>	1 and 3
<b>Permissible potential difference</b>	
between different circuits	500 V DC between 24 V DC and 5 V DC; 1500 V AC between 24 V DC and 230 V AC
<b>Degree and class of protection</b>	
Degree of protection acc. to EN 60529	
<ul style="list-style-type: none"> <li>IP20</li> </ul>	Yes
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> </ul>	0 °C
<ul style="list-style-type: none"> <li>horizontal installation, max.</li> </ul>	55 °C
<ul style="list-style-type: none"> <li>vertical installation, min.</li> </ul>	0 °C
<ul style="list-style-type: none"> <li>vertical installation, max.</li> </ul>	45 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
<ul style="list-style-type: none"> <li>permissible range, lower limit</li> </ul>	860 hPa
<ul style="list-style-type: none"> <li>permissible range, upper limit</li> </ul>	1 080 hPa
<b>Relative humidity</b>	
<ul style="list-style-type: none"> <li>Operation, min.</li> </ul>	5 %
<ul style="list-style-type: none"> <li>Operation, max.</li> </ul>	95 %; RH class 2 in accordance with IEC 1131-2

## Configuration

### Programming

- |                               |   |
|-------------------------------|---|
| • Command set                 | 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 |
| • Program processing          | free cycle (OB 1), interrupt-controller, time-controlled (1 to 255 ms)  |
| • Program organization        | 1 OB, 1 DB, 1 SDB subroutines with/without parameter transfer   |
| • Number of subroutines, max. | 64  |

### Programming language

- |       |     |
|-------|-----|
| — LAD | Yes |
| — FBD | Yes |
| — STL | Yes |

### Know-how protection

- |   |                                  |
|---|----------------------------------|
| • User program protection/password protection | Yes; 3-stage password protection |
|---|----------------------------------|

## Connection method

- |                       |    |
|-----------------------|----|
| Plug-in I/O terminals | No |
|-----------------------|----|

## Dimensions

- |        |       |
|--------|-------|
| Width  | 90 mm |
| Height | 80 mm |
| Depth  | 62 mm |

## Weights

- |                 |       |
|-----------------|-------|
| Weight, approx. | 310 g |
|-----------------|-------|

**last modified:** 04/13/2018