



SIMATIC S7-300, CPU 312 Central processing unit with MPI, Integr. power supply 24 V DC, Work memory 32 KB, Micro Memory Card required

Figure similar

General information	
HW functional status	01
Firmware version	V3.3
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
Mains buffering	
<ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
<ul style="list-style-type: none"> <li>Repeat rate, min.</li> </ul>	1 s
Input current	
Current consumption (rated value)	650 mA
Current consumption (in no-load operation), typ.	140 mA
Inrush current, typ.	3.5 A
$I^2t$	1 A <sup>2</sup> ·s
Power loss	
Power loss, typ.	4 W
Memory	
Work memory	
<ul style="list-style-type: none"> <li>integrated</li> </ul>	32 kbyte
<ul style="list-style-type: none"> <li>expandable</li> </ul>	No
Load memory	
<ul style="list-style-type: none"> <li>Plug-in (MMC)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Plug-in (MMC), max.</li> </ul>	8 Mbyte
<ul style="list-style-type: none"> <li>Data management on MMC (after last programming), min.</li> </ul>	10 a
Backup	
<ul style="list-style-type: none"> <li>present</li> </ul>	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> <li>without battery</li> </ul>	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.1 μs
for word operations, typ.	0.24 μs
for fixed point arithmetic, typ.	0.32 μs
for floating point arithmetic, typ.	1.1 μs
CPU-blocks	

Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
<b>DB</b>	
• Number, max.	1 024; Number range: 1 to 16000
• Size, max.	32 kbyte
<b>FB</b>	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	32 kbyte
<b>FC</b>	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	32 kbyte
<b>OB</b>	
• Number, max.	see instruction list
• Size, max.	32 kbyte
• Number of free cycle OBs	1; OB 1
• Number of time alarm OBs	1; OB 10
• Number of delay alarm OBs	2; OB 20, 21
• Number of cyclic interrupt OBs	4; OB 32, 33, 34, 35
• Number of process alarm OBs	1; OB 40
• Number of startup OBs	1; OB 100
• Number of asynchronous error OBs	4; OB 80, 82, 85, 87
• Number of synchronous error OBs	2; OB 121, 122
<b>Nesting depth</b>	
• per priority class	16
• additional within an error OB	4
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
<b>Counting range</b>	
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
Retentive data area (incl. timers, counters, flags), max.	32 kbyte
<b>Flag</b>	
• Size, max.	256 byte
• Retentivity available	Yes; MB 0 to MB 255
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes

<b>Local data</b>	
• per priority class, max.	32 kbyte; Max. 2 KB per block
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	1 024 byte
• Outputs	1 024 byte
<b>Process image</b>	
• Inputs	1 024 byte
• Outputs	1 024 byte
• Inputs, adjustable	1 024 byte
• Outputs, adjustable	1 024 byte
• Inputs, default	128 byte
• Outputs, default	128 byte
<b>Digital channels</b>	
• Inputs	256
— of which central	256
• Outputs	256
— of which central	256
<b>Analog channels</b>	
• Inputs	64
— of which central	64
• Outputs	64
— of which central	64
<b>Hardware configuration</b>	
Number of expansion units, max.	0
<b>Number of DP masters</b>	
• integrated	0
• via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	8
• CP, PtP	8
• CP, LAN	4
<b>Rack</b>	
• Racks, max.	1
• Modules per rack, max.	8
<b>Time of day</b>	
<b>Clock</b>	
• Software clock	Yes
• retentive and synchronizable	No; Buffered: No, Can be synchronized: Yes
• Deviation per day, max.	10 s; Typ.: 2 s
• Behavior of the clock following POWER-ON	the clock continues at the time of day it had when power was switched off
<b>Operating hours counter</b>	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)
• Granularity	1 h
• retentive	Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	Yes
• in AS, slave	No
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Digital outputs</b>	
Number of digital outputs	0
<b>Analog inputs</b>	
Number of analog inputs	0
<b>Analog outputs</b>	
Number of analog outputs	0

Interfaces	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	No
Interface types	
<ul style="list-style-type: none"> <li>● RS 485</li> <li>● Output current of the interface, max.</li> </ul>	Yes 200 mA
Protocols	
<ul style="list-style-type: none"> <li>● MPI</li> <li>● PROFIBUS DP master</li> <li>● PROFIBUS DP slave</li> <li>● Point-to-point connection</li> </ul>	Yes No No No
MPI	
<ul style="list-style-type: none"> <li>● Transmission rate, max.</li> </ul>	187.5 kbit/s
Services	
<ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Routing</li> <li>— Global data communication</li> <li>— S7 basic communication</li> <li>— S7 communication</li> <li>— S7 communication, as client</li> <li>— S7 communication, as server</li> </ul>	Yes No Yes Yes Yes; Only server, configured on one side No Yes
Protocols	
PROFIsafe	No
communication functions / header	
PG/OP communication	Yes
Data record routing	No
Global data communication	
<ul style="list-style-type: none"> <li>● supported</li> <li>● Number of GD loops, max.</li> <li>● Number of GD packets, max.</li> <li>● Number of GD packets, transmitter, max.</li> <li>● Number of GD packets, receiver, max.</li> <li>● Size of GD packets, max.</li> <li>● Size of GD packet (of which consistent), max.</li> </ul>	Yes 8 8 8 8 22 byte 22 byte
S7 basic communication	
<ul style="list-style-type: none"> <li>● supported</li> <li>● User data per job, max.</li> <li>● User data per job (of which consistent), max.</li> </ul>	Yes 76 byte 76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
S7 communication	
<ul style="list-style-type: none"> <li>● supported</li> <li>● as server</li> <li>● as client</li> <li>● User data per job, max.</li> <li>● User data per job (of which consistent), max.</li> </ul>	Yes Yes Yes; Via CP and loadable FB 180 byte; With PUT/GET 240 byte; as server
S5 compatible communication	
<ul style="list-style-type: none"> <li>● supported</li> </ul>	Yes; via CP and loadable FC
Number of connections	
<ul style="list-style-type: none"> <li>● overall</li> <li>● usable for PG communication               <ul style="list-style-type: none"> <li>— reserved for PG communication</li> <li>— adjustable for PG communication, min.</li> <li>— adjustable for PG communication, max.</li> </ul> </li> <li>● usable for OP communication               <ul style="list-style-type: none"> <li>— reserved for OP communication</li> <li>— adjustable for OP communication, min.</li> <li>— adjustable for OP communication, max.</li> </ul> </li> <li>● usable for S7 basic communication</li> </ul>	6 5 1 1 5 5 1 1 1 5 5 2

- reserved for S7 basic communication 0
- adjustable for S7 basic communication, min. 0
- adjustable for S7 basic communication, max. 2

**S7 message functions**

Number of login stations for message functions, max.	6; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300

**Test commissioning functions**

Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4

**Status/control**

<ul style="list-style-type: none"> <li>• Status/control variable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Variables</li> </ul>	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> <li>• Number of variables, max.</li> </ul>	30
<ul style="list-style-type: none"> <li>— of which status variables, max.</li> </ul>	30
<ul style="list-style-type: none"> <li>— of which control variables, max.</li> </ul>	14

**Forcing**

<ul style="list-style-type: none"> <li>• Forcing</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Forcing, variables</li> </ul>	Inputs, outputs
<ul style="list-style-type: none"> <li>• Number of variables, max.</li> </ul>	10

**Diagnostic buffer**

<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Number of entries, max.</li> </ul>	500
<ul style="list-style-type: none"> <li>— adjustable</li> </ul>	No
<ul style="list-style-type: none"> <li>— of which powerfail-proof</li> </ul>	100; Only the last 100 entries are retained
<ul style="list-style-type: none"> <li>• Number of entries readable in RUN, max.</li> </ul>	499
<ul style="list-style-type: none"> <li>— adjustable</li> </ul>	Yes; From 10 to 499
<ul style="list-style-type: none"> <li>— preset</li> </ul>	10

**Service data**

<ul style="list-style-type: none"> <li>• can be read out</li> </ul>	Yes
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**Ambient conditions**

Ambient temperature during operation	
<ul style="list-style-type: none"> <li>• min.</li> </ul>	0 °C
<ul style="list-style-type: none"> <li>• max.</li> </ul>	60 °C

**configuration / header**

Configuration software	
<ul style="list-style-type: none"> <li>• STEP 7</li> </ul>	Yes; V5.2 SP1 or higher with HW update

**configuration / programming / header**

<ul style="list-style-type: none"> <li>• Command set</li> </ul>	see instruction list
<ul style="list-style-type: none"> <li>• Nesting levels</li> </ul>	8
<ul style="list-style-type: none"> <li>• System functions (SFC)</li> </ul>	see instruction list
<ul style="list-style-type: none"> <li>• System function blocks (SFB)</li> </ul>	see instruction list

**Programming language**

— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
— HiGraph®	Yes

**Know-how protection**

<ul style="list-style-type: none"> <li>• User program protection/password protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Block encryption</li> </ul>	Yes; With S7 block Privacy

**Dimensions**

Width	40 mm
Height	125 mm
Depth	130 mm

**Weights**

Weight, approx.	270 g
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