

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)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	Yes
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> <li>Repeat rate, min.</li> </ul>	5 ms 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 <sup>2</sup> t	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
<ul style="list-style-type: none"> <li>Size of retentive memory for retentive data blocks</li> </ul>	32 kbyte

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 y

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.
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DB	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 1 to 16000
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	32 kbyte

FB	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 0 to 7999
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	32 kbyte

FC	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 0 to 7999
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	32 kbyte

OB	
<ul style="list-style-type: none"> <li>Description</li> </ul>	see instruction list
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	32 kbyte
<ul style="list-style-type: none"> <li>Number of free cycle OBs</li> </ul>	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

## Counters, timers and their retentivity

### S7 counter

• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7

### Counting range

— lower limit	0
— upper limit	999

### IEC counter

• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)

### S7 times

• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity

### Time range

— lower limit	10 ms
— upper limit	9 990 s

### IEC timer

• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)

## Data areas and their retentivity

retentive data area in total	all (incl. memory bits, times, counters)
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Flag	
• Number, 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
Data blocks	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
Local data	
• per priority class, max.	32 kbyte; Max. 2 KB per block
Address area	
I/O address area	
• Inputs	1 024 byte
• Outputs	1 024 byte
Process image	
• 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
Digital channels	
• Inputs	256
— of which central	256
• Outputs	256
— of which central	256
Analog channels	
• Inputs	64
— of which central	64
• Outputs	64
— of which central	64
Hardware configuration	
Number of expansion units, max.	0
Number of DP masters	
• integrated	0
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	4
Rack	

- Racks, max. 1
- Modules per rack, max. 8

## Time of day

Clock	
• 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
Operating hours counter	
• 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
Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	Yes
• in AS, slave	No

## Digital inputs

Number of digital inputs	0
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## Digital outputs

Number of digital outputs	0
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## Analog inputs

Number of analog inputs	0
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## Analog outputs

Number of analog outputs	0
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## 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
Physics	RS 485
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
Protocols	

• MPI	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	No
<b>MPI</b>	
• Transmission rate, max.	187.5 kbit/s
<b>Services</b>	
— PG/OP communication	Yes
— Routing	No
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes; Only server, configured on one side
— S7 communication, as client	No
— S7 communication, as server	Yes
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	No
<b>Global data communication</b>	
• supported	Yes
• Number of GD loops, max.	8
• Number of GD packets, max.	8
• Number of GD packets, transmitter, max.	8
• Number of GD packets, receiver, max.	8
• Size of GD packets, max.	22 byte
• Size of GD packet (of which consistent), max.	22 byte
<b>S7 basic communication</b>	
• supported	Yes
• User data per job, max.	76 byte
• User data per job (of which consistent), max.	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes; Via CP and loadable FB
• User data per job, max.	180 byte; With PUT/GET
• User data per job (of which consistent), max.	240 byte; as server
<b>S5 compatible communication</b>	
• supported	Yes; via CP and loadable FC
<b>Number of connections</b>	
• overall	6
• usable for PG communication	5

- reserved for PG communication
- adjustable for PG communication, min.
- adjustable for PG communication, max.
- usable for OP communication
  - reserved for OP communication
  - adjustable for OP communication, min.
  - adjustable for OP communication, max.
- usable for S7 basic communication
  - reserved for S7 basic communication
  - adjustable for S7 basic communication, min.
  - adjustable for S7 basic communication, max.

1  
1  
5  
5  
1  
1  
5  
2  
0  
0  
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

- Status/control variable
- Variables
- Number of variables, max.
  - of which status variables, max.
  - of which control variables, max.

Yes  
Inputs, outputs, memory bits, DB, times, counters  
30  
30  
14

#### Forcing

- Forcing
- Forcing, variables
- Number of variables, max.

Yes  
Inputs, outputs  
10

#### Diagnostic buffer

- present
- Number of entries, max.
  - adjustable
  - of which powerfail-proof
- Number of entries readable in RUN, max.
  - adjustable
  - preset

Yes  
500  
No  
100; Only the last 100 entries are retained  
499  
Yes; From 10 to 499  
10

#### Service data

• can be read out	Yes
<b>Ambient conditions</b>	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
<b>Configuration</b>	
Configuration software	
• STEP 7	Yes; V5.2 SP1 or higher with HW update
<b>Programming</b>	
• Command set	see instruction list
• Nesting levels	8
• System functions (SFC)	see instruction list
• System function blocks (SFB)	see instruction list
<b>Programming language</b>	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
— HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	270 g
<b>last modified:</b>	08/24/2020