



Figure similar

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

General information	
HW functional status	01
Firmware version	V3.3
Engineering with	
• Programming package	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	
• Mains/voltage failure stored energy time	5 ms
• Repeat rate, min.	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	
• integrated	32 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
• Data management on MMC (after last programming), min.	10 a
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	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>	

<ul style="list-style-type: none"> <li>• Retentivity adjustable</li> <li>• Retentivity preset</li> </ul>	<p>Yes; via non-retain property on DB</p> <p>Yes</p>
<b>Local data</b>	
<ul style="list-style-type: none"> <li>• per priority class, max.</li> </ul>	32 kbyte; Max. 2 KB per block
<b>Address area</b>	
<b>I/O address area</b>	
<ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> </ul>	<p>1 024 byte</p> <p>1 024 byte</p>
<b>Process image</b>	
<ul style="list-style-type: none"> <li>• Inputs</li> <li>• Outputs</li> <li>• Inputs, adjustable</li> <li>• Outputs, adjustable</li> <li>• Inputs, default</li> <li>• Outputs, default</li> </ul>	<p>1 024 byte</p> <p>1 024 byte</p> <p>1 024 byte</p> <p>1 024 byte</p> <p>128 byte</p> <p>128 byte</p>
<b>Digital channels</b>	
<ul style="list-style-type: none"> <li>• Inputs <ul style="list-style-type: none"> <li>— of which central</li> </ul> </li> <li>• Outputs <ul style="list-style-type: none"> <li>— of which central</li> </ul> </li> </ul>	<p>256</p> <p>256</p> <p>256</p> <p>256</p>
<b>Analog channels</b>	
<ul style="list-style-type: none"> <li>• Inputs <ul style="list-style-type: none"> <li>— of which central</li> </ul> </li> <li>• Outputs <ul style="list-style-type: none"> <li>— of which central</li> </ul> </li> </ul>	<p>64</p> <p>64</p> <p>64</p> <p>64</p>
<b>Hardware configuration</b>	
Number of expansion units, max.	0
<b>Number of DP masters</b>	
<ul style="list-style-type: none"> <li>• integrated</li> <li>• via CP</li> </ul>	<p>0</p> <p>4</p>
<b>Number of operable FMs and CPs (recommended)</b>	
<ul style="list-style-type: none"> <li>• FM</li> <li>• CP, PtP</li> <li>• CP, LAN</li> </ul>	<p>8</p> <p>8</p> <p>4</p>
<b>Rack</b>	
<ul style="list-style-type: none"> <li>• Racks, max.</li> <li>• Modules per rack, max.</li> </ul>	<p>1</p> <p>8</p>
<b>Time of day</b>	
<b>Clock</b>	
<ul style="list-style-type: none"> <li>• Software clock</li> <li>• retentive and synchronizable</li> <li>• Deviation per day, max.</li> <li>• Behavior of the clock following POWER-ON</li> </ul>	<p>Yes</p> <p>No; Buffered: No, Can be synchronized: Yes</p> <p>10 s; Typ.: 2 s</p> <p>the clock continues at the time of day it had when power was switched off</p>
<b>Operating hours counter</b>	
<ul style="list-style-type: none"> <li>• Number</li> <li>• Number/Number range</li> <li>• Range of values</li> <li>• Granularity</li> <li>• retentive</li> </ul>	<p>1</p> <p>0</p> <p>0 to 2<sup>31</sup> hours (when using SFC 101)</p> <p>1 h</p> <p>Yes; Must be restarted at each restart</p>
<b>Clock synchronization</b>	
<ul style="list-style-type: none"> <li>• supported</li> <li>• to MPI, master</li> <li>• to MPI, slave</li> <li>• in AS, master</li> <li>• in AS, slave</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>No</p>
<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
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	0
<b>1. Interface</b>	
Interface type	Integrated RS 485 interface
Isolated	No
<b>Interface types</b>	
<ul style="list-style-type: none"> <li>• RS 485</li> <li>• Output current of the interface, max.</li> </ul>	Yes 200 mA
<b>Protocols</b>	
<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
<b>MPI</b>	
<ul style="list-style-type: none"> <li>• Transmission rate, max.</li> </ul>	187.5 kbit/s
<b>Services</b>	
<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
<b>Protocols</b>	
PROFIsafe	No
<b>communication functions / header</b>	
PG/OP communication	Yes
Data record routing	No
<b>Global data communication</b>	
<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
<b>S7 basic communication</b>	
<ul style="list-style-type: none"> <li>• communication function / S7 basic communication</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)
<b>S7 communication</b>	
<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
<b>S5 compatible communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> </ul>	Yes; via CP and loadable FC
<b>Number of connections</b>	
<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> </ul>	6 5 1 1 5

- 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.

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

### Ambient conditions

#### Ambient temperature during operation

- min.
- max.

0 °C  
60 °C

### configuration / header

#### Configuration software

- STEP 7

Yes; V5.2 SP1 or higher with HW update

#### configuration / programming / header

- Command set
- Nesting levels
- System functions (SFC)
- System function blocks (SFB)

see instruction list  
8  
see instruction list  
see instruction list

#### Programming language

- LAD
- FBD
- STL
- SCL
- GRAPH
- HiGraph®

Yes  
Yes  
Yes  
Yes  
Yes  
Yes

#### Know-how protection

- User program protection/password protection
- Block encryption

Yes  
Yes; With S7 block Privacy

### Dimensions

Width	40 mm
-------	-------

Height	125 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	270 g
<b>last modified:</b>	9/7/2023 