

SIMATIC S7-300, CPU 312 CPU WITH MPI INTERFACE  
INTEGRATED 24 V DC POWER SUPPLY 16 KBYTE WORKING  
MEMORY MICRO MEMORY CARD NECESSARY

General information	
HW functional status	01
Firmware version	V2.0.0
Engineering with	
• Programming package	STEP 7 V5.1 SP4 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
Input current	
Current consumption (rated value)	0.6 A
Current consumption (in no-load operation), typ.	60 mA
Inrush current, typ.	2.5 A
$I^2t$	0.5 A <sup>2</sup> ·s
Power loss	
Power loss, typ.	2.5 W
Memory	
Work memory	
• integrated	16 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	4 Mbyte
• Data management on MMC (after last programming), min.	10 y
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.2 µs

for word operations, typ.	0.4 µs
for fixed point arithmetic, typ.	5 µs
for floating point arithmetic, typ.	6 µs

## CPU-blocks

Number of blocks (total)	1 024; (DBs, FCs, FBs OBs, SDBs); the maximum number of loadable blocks can be reduced by the MMC being used.
<b>DB</b>	
• Number, max.	511; Number range: 1 to 511
• Size, max.	16 kbyte
<b>FB</b>	
• Number, max.	512; Number range: 0 to 2047
• Size, max.	16 kbyte
<b>FC</b>	
• Number, max.	512; Number range: 0 to 2047
• Size, max.	16 kbyte
<b>OB</b>	
• Number, max.	see instruction list
• Size, max.	16 kbyte
• Number of free cycle OBs	1; OB 1
• Number of time alarm OBs	1; OB 10
• Number of delay alarm OBs	1; OB 20
• Number of cyclic interrupt OBs	1; OB 35
• Number of process alarm OBs	1; OB 40
• Number of startup OBs	1; OB 100
• Number of asynchronous error OBs	1; OB 80
• Number of synchronous error OBs	2; OB 121, 122
<b>Nesting depth</b>	
• per priority class	8
• additional within an error OB	4

## Counters, timers and their retentivity

<b>S7 counter</b>	
• Number	128
<b>Retentivity</b>	
— adjustable	Yes
— preset	Z 0 to Z 7
<b>Counting range</b>	
— adjustable	Yes
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
• present	Yes

• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	128
Retentivity	
— adjustable	Yes
— 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)
Flag	
• Number, max.	128 byte
• Retentivity available	Yes; MB 0 to MB 127
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
Data blocks	
• Retentivity adjustable	No
• Retentivity preset	Yes
Local data	
• per priority class, max.	256 byte
Address area	
I/O address area	
• Inputs	1 kbyte
• Outputs	1 kbyte
Process image	
• Inputs	128 byte
• Outputs	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
<b>Hardware configuration</b>	
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
<b>Time of day</b>	
Clock	
• Software clock	Yes
• retentive and synchronizable	No
• Deviation per day, max.	15 s
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
<b>1. Interface</b>	
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
MPI	
• Number of connections	6

• 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
— S7 communication, as client	No
— S7 communication, as server	Yes
<b>Communication functions</b>	
PG/OP communication	Yes
<b>Global data communication</b>	
• supported	Yes
• Number of GD loops, max.	4
• Number of GD packets, max.	4
• Number of GD packets, transmitter, max.	4
• Number of GD packets, receiver, max.	4
• 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.	64 byte
<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	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	5
• usable for OP communication	5
— reserved for OP communication	1
— adjustable for OP communication, min.	1

- 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  
2  
2  
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.	20

## Test commissioning functions

Status block	Yes
Single step	Yes
Number of breakpoints	2

### 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

Yes  
100  
No

## Configuration

### Configuration software

- STEP 7

Yes; V5.1 SP4 and higher

### Programming

- 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

Yes  
Yes

— STL

Yes

#### Know-how protection

- User program protection/password protection

Yes

#### Dimensions

Width

40 mm

Height

125 mm

Depth

130 mm

#### Weights

Weight, approx.

270 g

**last modified:**

08/15/2019