

SIMATIC S7-300, CPU 314 Central processing unit with MPI, Integr. power supply 24 V DC, work memory 128 KB, Micro Memory Card required



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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> </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 <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>   | 128 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> | 64 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.            | 0.06 µs |
| for word operations, typ.           | 0.12 µs |
| for fixed point arithmetic, typ.    | 0.16 µs |
| for floating point arithmetic, typ. | 0.59 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. |
|--------------------------|---|

##### 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>   | 64 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>   | 64 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>   | 64 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>               | 64 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  |
| <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 in total                  | all, max. 64 KB                          |

|   |                                    |
|---|------------------------------------|
| <b>Flag</b>   |                                    |
| • Number, max.                                      | 256 byte                           |
| • 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>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  | 1 024                              |
| — of which central                                  | 1 024                              |
| • Outputs   | 1 024                              |
| — of which central                                  | 1 024                              |
| <b>Analog channels</b>                              |                                    |
| • Inputs  | 256                                |
| — of which central                                  | 256                                |
| • Outputs   | 256                                |
| — of which central                                  | 256                                |
| <b>Hardware configuration</b>                       |                                    |
| Number of expansion units, max.                     | 3                                  |
| <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   | 10                                 |
| <b>Rack</b>   |                                    |
| • Racks, max.                                       | 4                                  |
| • Modules per rack, max.                            | 8                                  |

| Time of day   |  |
|---|--|
| <b>Clock</b>  |  |
| • Hardware clock (real-time)                              | Yes  |
| • retentive and synchronizable                            | Yes  |
| • Backup time   | 6 wk; At 40 °C ambient temperature                                       |
| • Deviation per day, max.                                 | 10 s; Typ.: 2 s  |
| • Behavior of the clock following POWER-ON                | Clock continues running after POWER OFF                                  |
| • Behavior of the clock following expiry of backup period | Clock continues to run with the time at which the power failure occurred |
| <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  |
| <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  |
| Physics   | RS 485   |
| Isolated  | No   |
| Power supply to interface (15 to 30 V DC), max.           | 200 mA   |
| <b>Protocols</b>  |  |

|   |  |
|---|--|
| • 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                                       | 12   |
| • usable for PG communication                   | 11   |

- 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  
11  
11  
1  
1  
11  
8  
0  
0  
8

### S7 message functions

|  |  |
|--|--|
| Number of login stations for message functions, max. | 12; 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                                    |
| — CFC   | 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.                               | 280 g                                  |
| <b>last modified:</b>                         | 04/09/2020                             |