

SIMATIC S7-300, CPU 314 Central processing unit with MPI, Integr. power supply 24 V DC, work memory 128 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> </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 |

|                   |     |
|-------------------|-----|
| <b>Power loss</b> |     |
| Power loss, typ.  | 4 W |

|               |  |
|---------------|--|
| <b>Memory</b> |  |
|---------------|--|

|  |           |
|--|-----------|
| <b>Work memory</b>   |           |
| <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  |

|   |         |
|---|---------|
| <b>Load memory</b>  |         |
| <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    |

|   |   |
|---|---|
| <b>Backup</b>   |   |
| <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                     |

|                             |  |
|-----------------------------|--|
| <b>CPU processing times</b> |  |
|-----------------------------|--|

|                                     |         |
|-------------------------------------|---------|
| 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 |

|                   |  |
|-------------------|--|
| <b>CPU-blocks</b> |  |
|-------------------|--|

|                          |   |
|--------------------------|---|
| 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>  |                                 |
| <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                        |

|  |                                |
|--|--------------------------------|
| <b>FB</b>  |                                |
| <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                       |

|  |                                |
|--|--------------------------------|
| <b>FC</b>  |                                |
| <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                       |

|  |                      |
|--|----------------------|
| <b>OB</b>  |                      |
| <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                          |

| 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                                     | 1 024                              |
| — of which central                           | 1 024                              |
| • Outputs                                    | 1 024                              |
| — of which central                           | 1 024                              |
| Analog channels                              |                                    |
| • Inputs                                     | 256                                |
| — of which central                           | 256                                |
| • Outputs                                    | 256                                |
| — of which central                           | 256                                |
| Hardware configuration                       |                                    |
| Number of expansion units, max.              | 3                                  |
| Number of DP masters                         |                                    |
| • integrated                                 | 0                                  |
| • via CP                                     | 4                                  |
| Number of operable FMs and CPs (recommended) |                                    |
| • FM   | 8                                  |
| • CP, PtP                                    | 8                                  |
| • CP, LAN                                    | 10                                 |
| Rack   |                                    |

- Racks, max. 4
- Modules per rack, max. 8

### Time of day

#### Clock

- 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

#### 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

### Digital outputs

Number of digital outputs 0

### Analog inputs

Number of analog inputs 0

### Analog outputs

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
- 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               | 1  |
| — adjustable for PG communication, min.       | 1  |
| — adjustable for PG communication, max.       | 11 |
| • usable for OP communication                 | 11 |
| — reserved for OP communication               | 1  |
| — adjustable for OP communication, min.       | 1  |
| — adjustable for OP communication, max.       | 11 |
| • usable for S7 basic communication           | 8  |
| — reserved for S7 basic communication         | 0  |
| — adjustable for S7 basic communication, min. | 0  |
| — adjustable for S7 basic communication, max. | 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          | Yes   |
| • Variables                        | Inputs, outputs, memory bits, DB, times, counters |
| • Number of variables, max.        | 30  |
| — of which status variables, max.  | 30  |
| — of which control variables, max. | 14  |

### Forcing

|                             |                 |
|-----------------------------|-----------------|
| • Forcing                   | Yes             |
| • Forcing, variables        | Inputs, outputs |
| • Number of variables, max. | 10              |

### Diagnostic buffer

|   |   |
|---|---|
| • present                                 | Yes   |
| • Number of entries, max.                 | 500   |
| — adjustable                              | No  |
| — of which powerfail-proof                | 100; Only the last 100 entries are retained |
| • Number of entries readable in RUN, max. | 499   |
| — adjustable                              | Yes; From 10 to 499                         |

|   |  |
|---|--|
| — preset                                      | 10                                     |
| <b>Service data</b>                           |  |
| • 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 |
| Programming                                   |  |
| • Command set                                 | see instruction list                   |
| • Nesting levels                              | 8                                      |
| • System functions (SFC)                      | see instruction list                   |
| • System function blocks (SFB)                | see instruction list                   |
| Programming language                          |  |
| — LAD   | Yes                                    |
| — FBD   | Yes                                    |
| — STL   | Yes                                    |
| — SCL   | Yes                                    |
| — CFC   | Yes                                    |
| — GRAPH                                       | Yes                                    |
| — HiGraph®                                    | Yes                                    |
| Know-how protection                           |  |
| • 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>                         | 08/13/2018                             |