



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                                                                                                                                         |                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 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)                                                                                                                                            | 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                                                                                                                                             |                                                                         |
| <ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> <li>Repeat rate, min.</li> </ul>                                       | 5 ms<br>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                                                                                                                                                 |                                                                         |
| <ul style="list-style-type: none"> <li>integrated</li> <li>expandable</li> </ul>                                                                            | 128 kbyte<br>No                                                         |
| Load memory                                                                                                                                                 |                                                                         |
| <ul style="list-style-type: none"> <li>Plug-in (MMC)</li> <li>Plug-in (MMC), max.</li> <li>Data management on MMC (after last programming), min.</li> </ul> | Yes<br>8 Mbyte<br>10 y                                                  |
| Backup                                                                                                                                                      |                                                                         |
| <ul style="list-style-type: none"> <li>present</li> <li>without battery</li> </ul>                                                                          | Yes; Guaranteed by MMC (maintenance-free)<br>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 $\mu$ s                                                                                  |
| <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>                                                 |                                                                                               |
| • Number, max.                                            | 1 024; Number range: 1 to 16000                                                               |
| • Size, max.                                              | 64 kbyte                                                                                      |
| <b>FB</b>                                                 |                                                                                               |
| • Number, max.                                            | 1 024; Number range: 0 to 7999                                                                |
| • Size, max.                                              | 64 kbyte                                                                                      |
| <b>FC</b>                                                 |                                                                                               |
| • Number, max.                                            | 1 024; Number range: 0 to 7999                                                                |
| • Size, max.                                              | 64 kbyte                                                                                      |
| <b>OB</b>                                                 |                                                                                               |
| • Number, max.                                            | see instruction list                                                                          |
| • Size, max.                                              | 64 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. | 64 kbyte                                                                                      |

|                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flag</b>                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Size, max.</li> <li>• Retentivity available</li> <li>• Retentivity preset</li> <li>• Number of clock memories</li> </ul>                                                                                                                                       | 256 byte<br>Yes; MB 0 to MB 255<br>MB 0 to MB 15<br>8; 1 memory byte                                                                                                                       |
| <b>Data blocks</b>                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Retentivity adjustable</li> <li>• Retentivity preset</li> </ul>                                                                                                                                                                                                | Yes; via non-retain property on DB<br>Yes                                                                                                                                                  |
| <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>                                                                                                                                                                                                                           | 1 024 byte<br>1 024 byte                                                                                                                                                                   |
| <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>                                                                                                       | 1 024 byte<br>1 024 byte<br>1 024 byte<br>1 024 byte<br>128 byte<br>128 byte                                                                                                               |
| <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>                                                   | 1 024<br>1 024<br>1 024<br>1 024                                                                                                                                                           |
| <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>                                                   | 256<br>256<br>256<br>256                                                                                                                                                                   |
| <b>Hardware configuration</b>                                                                                                                                                                                                                                                                           |                                                                                                                                                                                            |
| Number of expansion units, max.                                                                                                                                                                                                                                                                         | 3                                                                                                                                                                                          |
| <b>Number of DP masters</b>                                                                                                                                                                                                                                                                             |                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• integrated</li> <li>• via CP</li> </ul>                                                                                                                                                                                                                        | 0<br>4                                                                                                                                                                                     |
| <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>                                                                                                                                                                                                            | 8<br>8<br>10                                                                                                                                                                               |
| <b>Rack</b>                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Racks, max.</li> <li>• Modules per rack, max.</li> </ul>                                                                                                                                                                                                       | 4<br>8                                                                                                                                                                                     |
| <b>Time of day</b>                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                            |
| <b>Clock</b>                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Hardware clock (real-time)</li> <li>• retentive and synchronizable</li> <li>• Backup time</li> <li>• Deviation per day, max.</li> <li>• Behavior of the clock following POWER-ON</li> <li>• Behavior of the clock following expiry of backup period</li> </ul> | Yes<br>Yes<br>6 wk; At 40 °C ambient temperature<br>10 s; Typ.: 2 s<br>Clock continues running after POWER OFF<br>Clock continues to run with the time at which the power failure occurred |
| <b>Operating hours counter</b>                                                                                                                                                                                                                                                                          |                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>• Number</li> <li>• Range of values</li> <li>• Granularity</li> <li>• retentive</li> </ul>                                                                                                                                                                       | 1<br>0 to 2 <sup>31</sup> hours (when using SFC 101)<br>1 h<br>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                                                        |
| Isolated                                        | No                                                                                 |
| <b>Interface types</b>                          |                                                                                    |
| • RS 485                                        | Yes                                                                                |
| • Output current of the interface, 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                                                                                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• as client</li> <li>• User data per job, max.</li> <li>• User data per job (of which consistent), max.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Yes; Via CP and loadable FB<br>180 byte; With PUT/GET<br>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> <li>• usable for OP communication               <ul style="list-style-type: none"> <li>— reserved for OP communication</li> <li>— adjustable for OP communication, min.</li> <li>— adjustable for OP communication, max.</li> </ul> </li> <li>• usable for S7 basic communication               <ul style="list-style-type: none"> <li>— reserved for S7 basic communication</li> <li>— adjustable for S7 basic communication, min.</li> <li>— adjustable for S7 basic communication, max.</li> </ul> </li> </ul> | 12<br>11<br>1<br>1<br>11<br>11<br>1<br>1<br>11<br>8<br>0<br>0<br>8                                  |
| <b>S7 message functions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                     |
| 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                                                                                                 |
| <b>Test commissioning functions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                     |
| Status block                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes; Up to 2 simultaneously                                                                         |
| Single step                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Yes                                                                                                 |
| Number of breakpoints                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 4                                                                                                   |
| <b>Status/control</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                     |
| <ul style="list-style-type: none"> <li>• Status/control variable</li> <li>• Variables</li> <li>• Number of variables, max.               <ul style="list-style-type: none"> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes<br>Inputs, outputs, memory bits, DB, times, counters<br>30<br>30<br>14                          |
| <b>Forcing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                     |
| <ul style="list-style-type: none"> <li>• Forcing</li> <li>• Forcing, variables</li> <li>• Number of variables, max.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Yes<br>Inputs, outputs<br>10                                                                        |
| <b>Diagnostic buffer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                     |
| <ul style="list-style-type: none"> <li>• present</li> <li>• Number of entries, max.               <ul style="list-style-type: none"> <li>— adjustable</li> <li>— of which powerfail-proof</li> </ul> </li> <li>• Number of entries readable in RUN, max.               <ul style="list-style-type: none"> <li>— adjustable</li> <li>— preset</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes<br>500<br>No<br>100; Only the last 100 entries are retained<br>499<br>Yes; From 10 to 499<br>10 |
| <b>Service data</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                     |
| <ul style="list-style-type: none"> <li>• can be read out</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes                                                                                                 |
| <b>Ambient conditions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                     |
| <b>Ambient temperature during operation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                     |
| <ul style="list-style-type: none"> <li>• min.</li> <li>• max.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0 °C<br>60 °C                                                                                       |
| <b>Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                     |
| <b>Configuration software</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                     |
| <ul style="list-style-type: none"> <li>• STEP 7</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Yes; V5.2 SP1 or higher with HW update                                                              |
| <b>Programming</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                     |
| <ul style="list-style-type: none"> <li>• Command set</li> <li>• Nesting levels</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | see instruction list<br>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>                         | 3/25/2021  |