



SIMATIC S7-300, CPU 315-2DP Central processing unit with MPI Integr. power supply 24 V DC Work memory 256 KB 2nd interface DP master/slave Micro Memory Card required

| General information   |   |
|---|---|
| Product function  |   |
| • Isochronous mode  | Yes   |
| Engineering with  |   |
| • Programming package                                       | STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218 |
| Supply voltage  |   |
| Rated value (DC)  | 24 V  |
| permissible range, lower limit (DC)                         | 19.2 V  |
| permissible range, upper limit (DC)                         | 28.8 V  |
| external protection for power supply lines (recommendation) | 2 A min.  |
| Mains buffering   |   |
| • Mains/voltage failure stored energy time                  | 5 ms  |
| • Repeat rate, min.   | 1 s   |
| Input current   |   |
| Current consumption (rated value)                           | 850 mA  |
| Current consumption (in no-load operation), typ.            | 150 mA  |
| Inrush current, typ.  | 3.5 A   |
| I <sup>2</sup> t  | 1 A <sup>2</sup> ·s   |
| Power loss  |   |
| Power loss, typ.  | 4.5 W   |
| Memory  |   |
| Work memory   |   |
| • integrated  | 256 kbyte   |
| • expandable  | No  |
| Load memory   |   |
| • Plug-in (MMC)   | Yes   |
| • Plug-in (MMC), max.                                       | 8 Mbyte   |
| • Data management on MMC (after last programming), min.     | 10 y  |
| Backup  |   |
| • present   | Yes; Guaranteed by MMC (maintenance-free)                               |
| • without battery   | Yes; Program and data   |
| CPU processing times  |   |
| for bit operations, typ.                                    | 0.05 µs   |
| for word operations, typ.                                   | 0.09 µs   |
| for fixed point arithmetic, typ.                            | 0.12 µs   |

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| for floating point arithmetic, typ.           | 0.45 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>                                     |   |
| • 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 DPV1 alarm OBs                    | 3; OB 55, 56, 57  |
| • Number of isochronous mode OBs              | 1; OB 61  |
| • Number of startup OBs                       | 1; OB 100   |
| • Number of asynchronous error OBs            | 5; OB 80, 82, 85, 86, 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)  |

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| <b>Data areas and their retentivity</b>                   |  |
| Flag  |  |
| • Size, max.  | 2 048 byte   |
| • Retentivity available                                   | Yes; MB 0 to MB 2 047  |
| • 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  |
| <b>Address area</b>                                       |  |
| I/O address area  |  |
| • Inputs  | 2 048 byte   |
| • Outputs   | 2 048 byte   |
| of which distributed                                      |  |
| — Inputs  | 2 048 byte   |
| — Outputs   | 2 048 byte   |
| Process image   |  |
| • Inputs  | 2 048 byte   |
| • Outputs   | 2 048 byte   |
| • Inputs, adjustable                                      | 2 048 byte   |
| • Outputs, adjustable                                     | 2 048 byte   |
| • Inputs, default   | 128 byte   |
| • Outputs, default  | 128 byte   |
| Subprocess images   |  |
| • Number of subprocess images, max.                       | 1  |
| Digital channels  |  |
| • Inputs  | 16 384   |
| — of which central  | 1 024  |
| • Outputs   | 16 384   |
| — of which central  | 1 024  |
| Analog channels   |  |
| • Inputs  | 1 024  |
| — of which central  | 256  |
| • Outputs   | 1 024  |
| — of which central  | 256  |
| <b>Hardware configuration</b>                             |  |
| Number of expansion units, max.                           | 3  |
| Number of DP masters                                      |  |
| • integrated  | 1  |
| • 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  |
| <b>Time of day</b>  |  |
| 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 |

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| <b>Operating hours counter</b>           |   |
| • Number                                 | 1   |
| • 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   |
| • to DP, master                          | Yes; With DP slave only slave clock             |
| • to DP, 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              | 2; MPI and PROFIBUS DP                          |
| 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                                | Yes   |
| — 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>2. Interface</b>                      |   |
| Interface type                           | Integrated RS 485 interface                     |
| Isolated                                 | Yes   |
| <b>Interface types</b>                   |   |
| • RS 485                                 | Yes   |
| • Output current of the interface, max.  | 200 mA  |
| <b>Protocols</b>                         |   |
| • MPI                                    | No  |
| • PROFIBUS DP master                     | Yes   |
| • PROFIBUS DP slave                      | Yes   |

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| • Point-to-point connection  | No   |
| <b>PROFIBUS DP master</b>  |  |
| • Transmission rate, max.  | 12 Mbit/s  |
| • Number of DP slaves, max.  | 124; Per station   |
| <b>Services</b>  |  |
| — PG/OP communication  | Yes  |
| — Routing  | Yes  |
| — Global data communication  | No   |
| — S7 basic communication   | Yes; I blocks only   |
| — S7 communication   | Yes; Only server, configured on one side   |
| — S7 communication, as client  | No   |
| — S7 communication, as server  | Yes  |
| — Equidistance   | Yes  |
| — Isochronous mode   | Yes; OB 61   |
| — SYNC/FREEZE  | Yes  |
| — Activation/deactivation of DP slaves                                       | Yes  |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8  |
| — DPV1   | Yes  |
| <b>Address area</b>  |  |
| — Inputs, max.   | 2 048 byte   |
| — Outputs, max.  | 2 048 byte   |
| <b>User data per DP slave</b>  |  |
| — Inputs, max.   | 244 byte   |
| — Outputs, max.  | 244 byte   |
| <b>PROFIBUS DP slave</b>   |  |
| • GSD file   | The latest GSD file is available at: <a href="http://www.siemens.com/profibus-gsd">http://www.siemens.com/profibus-gsd</a> |
| • Transmission rate, max.  | 12 Mbit/s  |
| • automatic baud rate search   | Yes; only with passive interface   |
| • Address area, max.   | 32   |
| • User data per address area, max.   | 32 byte  |
| <b>Services</b>  |  |
| — PG/OP communication  | Yes  |
| — Routing  | Yes; Only with active interface  |
| — Global data communication  | No   |
| — S7 basic communication   | No   |
| — S7 communication   | Yes; Only server, configured on one side   |
| — S7 communication, as client  | No   |
| — S7 communication, as server  | Yes  |
| — Direct data exchange (slave-to-slave communication)                        | Yes  |
| — DPV1   | No   |
| <b>Transfer memory</b>   |  |
| — Inputs   | 244 byte   |
| — Outputs  | 244 byte   |
| <b>Communication functions</b>   |  |
| PG/OP communication  | Yes  |
| Data record routing  | Yes  |
| <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  |

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| • 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  | 16   |
| • usable for PG communication                        | 15   |
| — reserved for PG communication                      | 1  |
| — adjustable for PG communication, min.              | 1  |
| — adjustable for PG communication, max.              | 15   |
| • usable for OP communication                        | 15   |
| — reserved for OP communication                      | 1  |
| — adjustable for OP communication, min.              | 1  |
| — adjustable for OP communication, max.              | 15   |
| • usable for S7 basic communication                  | 12   |
| — reserved for S7 basic communication                | 0  |
| — adjustable for S7 basic communication, min.        | 0  |
| — adjustable for S7 basic communication, max.        | 12   |
| <b>S7 message functions</b>                          |  |
| Number of login stations for message functions, max. | 16; 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>                                |  |
| • 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   |
| <b>Forcing</b>                                       |  |
| • Forcing  | Yes  |
| • Forcing, variables                                 | Inputs, outputs  |
| • Number of variables, max.                          | 10   |
| <b>Diagnostic buffer</b>                             |  |
| • 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.            |  |
| — adjustable   | Yes; From 10 to 499  |
| — preset   | 10   |
| <b>Service data</b>                                  |  |
| • can be read out                                    | Yes  |
| <b>Ambient conditions</b>                            |  |
| <b>Ambient temperature during operation</b>          |  |
| • min.   | 0 °C   |
| • max.   | 60 °C  |
| <b>Configuration</b>                                 |  |

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| <b>Configuration software</b>                 |  |
| • 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.                               | 290 g                                  |

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