



SIMATIC S7-300, CPU 317F-2DP, Central processing unit with 1.5 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP master/slave Micro Memory Card required Can be used with software package S7 Distributed Safety V5.2 SP1 or higher

General information	
HW functional status	01
Firmware version	V3.3
Engineering with	
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 202 + Distributed Safety
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.
Input current	
Current consumption (rated value)	870 mA
Current consumption (in no-load operation), typ.	120 mA
Inrush current, typ.	4 A
I <sup>2</sup> t	1 A <sup>2</sup> ·s
Power loss	
Power loss, typ.	4.5 W
Memory	
Work memory	
• integrated	1 536 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.	0.025 µs
for word operations, typ.	0.03 µs
for fixed point arithmetic, typ.	0.04 µs
for floating point arithmetic, typ.	0.16 µs
CPU-blocks	
Number of blocks (total)	2 048; (DBs, FCs, FBs); the maximum number of loadable blocks can

	be reduced by the MMC used.
<b>DB</b>	
• Number, max.	2 048; Number range: 1 to 16000
• Size, max.	64 kbyte
<b>FB</b>	
• Number, max.	2 048; Number range: 0 to 7999
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	2 048; 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	512
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	511
— 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	512
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	511
— 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>	
<b>Flag</b>	
• Size, max.	4 096 byte

<ul style="list-style-type: none"> <li>• Retentivity available</li> <li>• Retentivity preset</li> <li>• Number of clock memories</li> </ul>	Yes; From MB 0 to MB 4 095 MB 0 to MB 15 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 Yes
<b>Local data</b>	
<ul style="list-style-type: none"> <li>• per priority class, max.</li> </ul>	32 768 byte; Max. 2048 bytes 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>	8 192 byte 8 192 byte
<b>of which distributed</b>	
<ul style="list-style-type: none"> <li>— Inputs</li> <li>— Outputs</li> </ul>	8 192 byte 8 192 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>	8 192 byte 8 192 byte 8 192 byte 8 192 byte 1 024 byte 1 024 byte
<b>Subprocess images</b>	
<ul style="list-style-type: none"> <li>• Number of subprocess images, max.</li> </ul>	1
<b>Digital channels</b>	
<ul style="list-style-type: none"> <li>• Inputs</li> <li>— of which central</li> <li>• Outputs</li> <li>— of which central</li> </ul>	65 536 1 024 65 536 1 024
<b>Analog channels</b>	
<ul style="list-style-type: none"> <li>• Inputs</li> <li>— of which central</li> <li>• Outputs</li> <li>— of which central</li> </ul>	4 096 256 4 096 256
<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>	2 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 8 10
<b>Rack</b>	
<ul style="list-style-type: none"> <li>• Racks, max.</li> <li>• Modules per rack, max.</li> </ul>	4 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 Yes 6 wk; At 40 °C ambient temperature 10 s; Typ.: 2 s Clock continues running after POWER OFF 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>• Number/Number range</li> </ul>	4 0 to 3

<ul style="list-style-type: none"> <li>• Range of values</li> <li>• Granularity</li> <li>• retentive</li> </ul>	0 to 2 <sup>31</sup> hours (when using SFC 101) 1 h Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
<ul style="list-style-type: none"> <li>• supported</li> <li>• to MPI, master</li> <li>• to MPI, slave</li> <li>• to DP, master</li> <li>• to DP, slave</li> <li>• in AS, master</li> <li>• in AS, slave</li> <li>• on Ethernet via NTP</li> </ul>	Yes Yes Yes Yes; With DP slave only slave clock Yes Yes Yes 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
Number of RS 422 interfaces	0
<b>1. Interface</b>	
Interface type	Integrated RS 485 interface
Isolated	Yes
<b>Interface types</b>	
<ul style="list-style-type: none"> <li>• RS 485</li> <li>• Output current of the interface, max.</li> </ul>	Yes 200 mA
<b>Protocols</b>	
<ul style="list-style-type: none"> <li>• MPI</li> <li>• PROFIBUS DP master</li> <li>• PROFIBUS DP slave</li> <li>• Point-to-point connection</li> </ul>	Yes Yes Yes; A DP slave at both interfaces simultaneously is not possible No
<b>MPI</b>	
<ul style="list-style-type: none"> <li>• Transmission rate, max.</li> </ul>	12 Mbit/s
<b>Services</b>	
<ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Routing</li> <li>— Global data communication</li> <li>— S7 basic communication</li> <li>— S7 communication</li> <li>— S7 communication, as client</li> <li>— S7 communication, as server</li> </ul>	Yes Yes Yes Yes Yes; Only server, configured on one side No; but via CP and loadable FB Yes
<b>PROFIBUS DP master</b>	
<ul style="list-style-type: none"> <li>• Transmission rate, max.</li> <li>• Number of DP slaves, max.</li> </ul>	12 Mbit/s 124
<b>Services</b>	
<ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Routing</li> <li>— Global data communication</li> <li>— S7 basic communication</li> <li>— S7 communication</li> <li>— S7 communication, as client</li> <li>— S7 communication, as server</li> </ul>	Yes Yes No Yes; I blocks only Yes; Only server, configured on one side No Yes

— Equidistance	Yes
— Isochronous mode	No
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Number of DP slaves that can be simultaneously activated/deactivated, max.	8
— Direct data exchange (slave-to-slave communication)	Yes; as subscriber
— DPV1	Yes
<b>Address area</b>	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
<b>PROFIBUS DP slave</b>	
• 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; Connection configured on one side only
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte
<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; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No
<b>PROFIBUS DP master</b>	
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	124
<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; but via CP and loadable FB
— 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
— Direct data exchange (slave-to-slave communication)	Yes; as subscriber
— DPV1	Yes
<b>Address area</b>	
— Inputs, max.	8 192 byte
— Outputs, max.	8 192 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 on the Internet ( <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; but via CP and loadable FB
— 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
• 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.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
<b>S5 compatible communication</b>	
• supported	Yes; via CP and loadable FC
<b>Number of connections</b>	
• overall	32
• usable for PG communication	31

— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	31
• usable for OP communication	31
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	31
• usable for S7 basic communication	30
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	30
• usable for routing	X1 as a MPI, max. 10; X1 as DP Master max. 24; X1 as DP Slave (active) max. 14; X2 as DP Master max. 24; X2 as DP Slave (active) max. 14
<b>S7 message functions</b>	
Number of login stations for message functions, max.	32; 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.	499
— 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>	
<b>Configuration software</b>	
• STEP 7	Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
• STEP 7 Lite	No
<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
Know-how protection	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	40 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	360 g
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