

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	
<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 202 + Distributed Safety
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
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	
<b>Work memory</b>	
<ul style="list-style-type: none"> <li>integrated</li> </ul>	1 536 kbyte
<ul style="list-style-type: none"> <li>expandable</li> </ul>	No
<ul style="list-style-type: none"> <li>Size of retentive memory for retentive data blocks</li> </ul>	256 kbyte
<b>Load memory</b>	
<ul style="list-style-type: none"> <li>Plug-in (MMC)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Plug-in (MMC), max.</li> </ul>	8 Mbyte
<ul style="list-style-type: none"> <li>Data management on MMC (after last programming), min.</li> </ul>	10 y
<b>Backup</b>	
<ul style="list-style-type: none"> <li>present</li> </ul>	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> <li>without battery</li> </ul>	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.025 $\mu$ s
for word operations, typ.	0.03 $\mu$ s
for fixed point arithmetic, typ.	0.04 $\mu$ s
for floating point arithmetic, typ.	0.16 $\mu$ s
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>	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	2 048; Number range: 1 to 16000
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
<b>FB</b>	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	2 048; Number range: 0 to 7999
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
<b>FC</b>	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	2 048; Number range: 0 to 7999
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
<b>OB</b>	
<ul style="list-style-type: none"> <li>Description</li> </ul>	see instruction list
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	64 kbyte
<ul style="list-style-type: none"> <li>Number of free cycle OBs</li> </ul>	1; OB 1
<ul style="list-style-type: none"> <li>Number of time alarm OBs</li> </ul>	1; OB 10
<ul style="list-style-type: none"> <li>Number of delay alarm OBs</li> </ul>	2; OB 20, 21
<ul style="list-style-type: none"> <li>Number of cyclic interrupt OBs</li> </ul>	4; OB 32, 33, 34, 35
<ul style="list-style-type: none"> <li>Number of process alarm OBs</li> </ul>	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>	
retentive data area in total	all, max. 256 KB
<b>Flag</b>	
• Number, max.	4 096 byte

• Retentivity available	Yes; From MB 0 to MB 4 095
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	32 768 byte; Max. 2048 bytes per block
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	8 192 byte
• Outputs	8 192 byte
<b>of which distributed</b>	
— Inputs	8 192 byte
— Outputs	8 192 byte
<b>Process image</b>	
• Inputs	8 192 byte
• Outputs	8 192 byte
• Inputs, adjustable	8 192 byte
• Outputs, adjustable	8 192 byte
• Inputs, default	1 024 byte
• Outputs, default	1 024 byte
<b>Subprocess images</b>	
• Number of subprocess images, max.	1
<b>Digital channels</b>	
• Inputs	65 536
— of which central	1 024
• Outputs	65 536
— of which central	1 024
<b>Analog channels</b>	
• Inputs	4 096
— of which central	256
• Outputs	4 096
— of which central	256
<b>Hardware configuration</b>	
Number of expansion units, max.	3
<b>Number of DP masters</b>	
• integrated	2
• via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	8

• CP, PtP	8
• CP, LAN	10
<b>Rack</b>	
• Racks, max.	4
• Modules per rack, max.	8
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 s; Typ.: 2 s
• Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
• Behavior of the clock following expiry of backup period	Clock continues to run with the time at which the power failure occurred
<b>Operating hours counter</b>	
• Number	4
• Number/Number range	0 to 3
• 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	Yes
• on Ethernet via NTP	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
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
<b>Protocols</b>	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No
<b>MPI</b>	
• Transmission rate, max.	12 Mbit/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; but via CP and loadable FB
— S7 communication, as server	Yes
<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
— S7 communication, as server	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
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), 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



## Communication functions

PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
<ul style="list-style-type: none"> <li>supported</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Number of GD loops, max.</li> </ul>	8
<ul style="list-style-type: none"> <li>Number of GD packets, max.</li> </ul>	8
<ul style="list-style-type: none"> <li>Number of GD packets, transmitter, max.</li> </ul>	8
<ul style="list-style-type: none"> <li>Number of GD packets, receiver, max.</li> </ul>	8
<ul style="list-style-type: none"> <li>Size of GD packets, max.</li> </ul>	22 byte
<ul style="list-style-type: none"> <li>Size of GD packet (of which consistent), max.</li> </ul>	22 byte
<b>S7 basic communication</b>	
<ul style="list-style-type: none"> <li>supported</li> </ul>	Yes
<ul style="list-style-type: none"> <li>User data per job, max.</li> </ul>	76 byte
<ul style="list-style-type: none"> <li>User data per job (of which consistent), max.</li> </ul>	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
<b>S7 communication</b>	
<ul style="list-style-type: none"> <li>supported</li> </ul>	Yes
<ul style="list-style-type: none"> <li>as server</li> </ul>	Yes
<ul style="list-style-type: none"> <li>as client</li> </ul>	Yes; Via CP and loadable FB
<ul style="list-style-type: none"> <li>User data per job, max.</li> </ul>	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>	
<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> </ul>	32
<ul style="list-style-type: none"> <li>usable for PG communication</li> </ul>	31
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>reserved for PG communication</li> </ul> </li> </ul>	1
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for PG communication, min.</li> </ul> </li> </ul>	1
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for PG communication, max.</li> </ul> </li> </ul>	31
<ul style="list-style-type: none"> <li>usable for OP communication</li> </ul>	31
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>reserved for OP communication</li> </ul> </li> </ul>	1
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for OP communication, min.</li> </ul> </li> </ul>	1
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for OP communication, max.</li> </ul> </li> </ul>	31
<ul style="list-style-type: none"> <li>usable for S7 basic communication</li> </ul>	30
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>reserved for S7 basic communication</li> </ul> </li> </ul>	0
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for S7 basic communication, min.</li> </ul> </li> </ul>	0
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>adjustable for S7 basic communication, max.</li> </ul> </li> </ul>	30
<ul style="list-style-type: none"> <li>usable for routing</li> </ul>	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

S7 message functions	
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
Test commissioning functions	
Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Status/control	
<ul style="list-style-type: none"> <li>• Status/control variable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Variables</li> </ul>	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> <li>• Number of variables, max.</li> </ul>	30
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— of which status variables, max.</li> </ul> </li> </ul>	30
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— of which control variables, max.</li> </ul> </li> </ul>	14
Forcing	
<ul style="list-style-type: none"> <li>• Forcing</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Forcing, variables</li> </ul>	Inputs, outputs
<ul style="list-style-type: none"> <li>• Number of variables, max.</li> </ul>	10
Diagnostic buffer	
<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Number of entries, max.</li> </ul>	500
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— adjustable</li> </ul> </li> </ul>	No
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— of which powerfail-proof</li> </ul> </li> </ul>	100; Only the last 100 entries are retained
<ul style="list-style-type: none"> <li>• Number of entries readable in RUN, max.</li> </ul>	499
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— adjustable</li> </ul> </li> </ul>	Yes; From 10 to 499
<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>— preset</li> </ul> </li> </ul>	10
Service data	
<ul style="list-style-type: none"> <li>• can be read out</li> </ul>	Yes
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> <li>• min.</li> </ul>	0 °C
<ul style="list-style-type: none"> <li>• max.</li> </ul>	60 °C
Configuration	
Configuration software	
<ul style="list-style-type: none"> <li>• STEP 7</li> </ul>	Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
<ul style="list-style-type: none"> <li>• STEP 7 Lite</li> </ul>	No
Programming	
<ul style="list-style-type: none"> <li>• Command set</li> </ul>	see instruction list
<ul style="list-style-type: none"> <li>• Nesting levels</li> </ul>	8

- System functions (SFC) see instruction list
- System function blocks (SFB) see instruction list

#### Programming language

— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes

#### Know-how protection

- User program protection/password protection Yes
- Block encryption Yes; With S7 block Privacy

#### Dimensions

Width	40 mm
Height	125 mm
Depth	130 mm

#### Weights

Weight, approx. 360 g

**last modified:** 10/09/2020