Data sheet

SIMATIC S7-300 CPU 317-2 PN/DP, Central processing unit with 1 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface Ethernet PROFINET, with 2-port switch, Micro Memory Card required



General information	
HW functional status	01
Firmware version	V3.2
Product function	
• Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
Programming package	STEP 7 V5.5 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 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)	750 mA
Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	4 A
l²t	1 A ² ·s
Power loss	
Power loss, typ.	4.65 W
Memory	
Work memory	
• integrated	1 024 kbyte
• expandable	No
 Size of retentive memory for retentive data blocks 	256 kbyte
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.
DB	
Number, max.	2 048; Number range: 1 to 16000
	2 048; Number range: 1 to 16000 64 kbyte
• Number, max.	
Number, max.Size, max.	
Number, max.Size, max. FB	64 kbyte
Number, max.Size, max.FBNumber, max.	64 kbyte 2 048; Number range: 0 to 7999
 Number, max. Size, max. FB Number, max. Size, max. 	64 kbyte 2 048; Number range: 0 to 7999
 Number, max. Size, max. FB Number, max. Size, max. FC	64 kbyte 2 048; Number range: 0 to 7999 64 kbyte
 Number, max. Size, max. FB Number, max. Size, max. FC Number, max. 	64 kbyte 2 048; Number range: 0 to 7999 64 kbyte 2 048; Number range: 0 to 7999
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 Number, max. Size, max. Number, max. Size, max. FC Number, max. Size, max. OB OB	64 kbyte 2 048; Number range: 0 to 7999 64 kbyte 2 048; Number range: 0 to 7999 64 kbyte

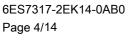


2; OB 20, 21
4; OB 32, 33, 34, 35
1; OB 40
3; OB 55, 56, 57
1; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
1; OB 100
6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
2; OB 121, 122
16
4

Counters, timers and their retentivity	
S7 counter	
Number	512
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	511
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	512
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	511
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB



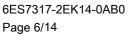
Data areas and their retentivity	
retentive data area in total	all, max. 256 KB
Flag	
• Number, max.	4 096 byte
Retentivity available	Yes; From MB 0 to MB 4 095
Retentivity preset	MB 0 to MB 15
 Number of clock memories 	8; 1 memory byte
Data blocks	
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity preset	Yes
Local data	
● per priority class, max.	32 768 byte; Max. 2048 bytes per block
Address area	
I/O address area	
• Inputs	8 192 byte
Outputs	8 192 byte
of which distributed	
— Inputs	8 192 byte
— Outputs	8 192 byte
Process image	
• Inputs	8 192 byte
Outputs	8 192 byte
• Inputs, adjustable	8 192 byte
Outputs, adjustable	8 192 byte
• Inputs, default	256 byte
Outputs, default	256 byte
Subprocess images	
Number of subprocess images, max.	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
• Inputs	65 536
— of which central	1 024
Outputs	65 536
— of which central	1 024
Analog channels	
• Inputs	4 096
— of which central	256
Outputs	4 096
— of which central	256
Hardware configuration	

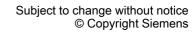


Number of expansion units, max.	3
Number of DP masters	·
• integrated	1
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	10
Rack	
• Racks, max.	4
Modules per rack, max.	8
modulee per ruek, max.	
Time of day	
Clock	
 Hardware clock (real-time) 	Yes
 retentive and synchronizable 	Yes
Backup time	6 wk; At 40 °C ambient temperature
 Deviation per day, max. 	10 s; Typ.: 2 s
 Behavior of the clock following POWER-ON 	Clock continues running after POWER OFF
 Behavior of the clock following expiry of backup period 	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
Number	4
Number/Number range	0 to 3
Range of values	0 to 2^31 hours (when using SFC 101)
Granularity	1 h
• retentive	Yes; Must be restarted at each restart
Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• 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	Yes; As client
Digital inputs	
Number of digital inputs	0
Digital outputs	
Number of digital outputs	0
Analog inputs	



Number of analog inputs	0
Analog outputs	
Number of analog outputs	0
Interfaces	
Number of industrial Ethernet interfaces	1; 2 ports (switch) RJ45
Number of PROFINET interfaces	1; 2 ports (switch) RJ45
Number of RS 485 interfaces	1; Combined MPI / PROFIBUS DP
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Protocols	
• MPI	Yes
 PROFIBUS DP master 	Yes
PROFIBUS DP slave	Yes
Point-to-point connection	No
MPI	
Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
 Global data communication 	Yes
 S7 basic communication 	Yes
— S7 communication	Yes
 S7 communication, as client 	No; but via CP and loadable FB
 S7 communication, as server 	Yes
PROFIBUS DP master	
Transmission rate, max.	12 Mbit/s
 Number of DP slaves, max. 	124
Services	
— PG/OP communication	Yes
— Routing	Yes
 Global data communication 	No
 — S7 basic communication 	Yes; I blocks only
— S7 communication	Yes
 S7 communication, as client 	No
— S7 communication, as server	Yes
— Equidistance	Yes





— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on
loodinenede mede	PROFIBUS DP or PROFINET IO
— 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
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
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
Services	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
 Global data communication 	No
 S7 basic communication 	No
— S7 communication	Yes
 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
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
2. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes



Autocrossing

Change of IP address at runtime, supported



Yes

Yes

terface types	
Number of ports	2
• integrated switch	Yes
rotocols	
• MPI	No
PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
PROFIBUS DP master	No
PROFIBUS DP slave	No
Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	Yes
Media redundancy	Yes
ROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; with loadable FBs, max. configurable connections: 16, max number of instances: 32
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively o PROFIBUS DP or PROFINET IO
— IRT	Yes
— Shared device	Yes
— Prioritized startup	Yes
 Number of IO devices with prioritized 	32
startup, max.	
 Number of connectable IO Devices, max. 	128
— Of which IO devices with IRT, max.	64
— of which in line, max.	64
 Number of IO Devices with IRT and the option "high flexibility" 	128
— of which in line, max.	61
 Number of connectable IO Devices for RT, max. 	128
— of which in line, max.	128
Activation/deactivation of IO Devices	Yes
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
— IO Devices changing during operation (partner ports), supported	Yes
Number of IO Devices per tool, max.	8
Device replacement without swap medium	Yes



— Send cycles	250 μ s, 500 μ s,1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option)
— Updating time	250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, technical Data" for more details)
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data consistency, max.	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32
Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	2
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
 User data per submodule, max. 	1 024 byte
PROFINET CBA	
 acyclic transmission 	Yes
• cyclic transmission	Yes
Open IE communication	
 Number of connections, max. 	16
 Local port numbers used at the system end 	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
Protocols	
Redundancy mode	
Media redundancy	
 Switchover time on line break, typ. 	200 ms; PROFINET MRP
— Number of stations in the ring, max.	50
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs

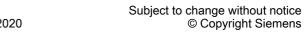


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Number of connections, max.	16
 Data length for connection type 01H, max. 	1 460 byte
 Data length for connection type 11H, max. 	32 768 byte
 several passive connections per port, 	Yes
supported	
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 	16
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 	16
— Data length, max.	1 472 byte
Web server	
• supported	Yes
 User-defined websites 	Yes
 Number of HTTP clients 	5
Isochronous mode	
Isochronous operation (application synchronized up	Yes; Via PROFIBUS DP or PROFINET interface
to terminal)	
Communication functions	
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
• supported	Yes
Number of CD loops, may	8

,	
Communication functions	
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
• 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
S7 basic communication	
• 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)
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes; via integrated PROFINET interface and loadable FB or 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)



S5 compatible communication



Ö PNAP

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• supported	Yes; via CP and loadable FC
PROFINET CBA (at set setpoint communication load)	
Setpoint for the CPU communication load	50 %
 Number of remote interconnection partners 	32
 Number of functions, master/slave 	30
 Total of all master/slave connections 	1 000
 Data length of all incoming connections master/slave, max. 	4 000 byte
 Data length of all outgoing connections master/slave, max. 	4 000 byte
 Number of device-internal and PROFIBUS interconnections 	500
 Data length of device-internal und PROFIBUS interconnections, max. 	4 000 byte
 Data length per connection, max. 	1 400 byte
Remote interconnections with acyclic transmission	
— Sampling interval, min.	500 ms
 Number of incoming interconnections 	100
 Number of outgoing interconnections 	100
 Data length of all incoming 	2 000 byte
interconnections, max.	
 Data length of all outgoing 	2 000 byte
interconnections, max.	
Data length per connection, max.	1 400 byte
Remote interconnections with cyclic transmission	40
 Transmission frequency: Transmission interval, min. 	10 ms
 Number of incoming interconnections 	200
 Number of outgoing interconnections 	200
 Data length of all incoming interconnections, max. 	2 000 byte
 Data length of all outgoing interconnections, max. 	2 000 byte
 Data length per connection, max. 	450 byte
HMI variables via PROFINET (acyclic)	
 Number of stations that can log on for HMI variables (PN OPC/iMap) 	3; 2x PN OPC/1x iMap
 HMI variable updating 	500 ms
— Number of HMI variables	200
 Data length of all HMI variables, max. 	2 000 byte
PROFIBUS proxy functionality	
— supported	Yes
— Number of linked PROFIBUS devices	16



— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• 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 S7 communication	16
 reserved for S7 communication 	0
 adjustable for S7 communication, min. 	0
 adjustable for S7 communication, max. 	16
• total number of instances, max.	32
usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.
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	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
 Number of variables, max. 	30
— of which status variables, max.	30
— of which control variables, max.	14
Forcing	
• Forcing	Yes



Number of variables, max.	10
Diagnostic buffer	
• present	Yes
Number of entries, max.	500
— adjustable	No
— of which powerfail-proof	100; Only the last 100 entries are retained
 Number of entries readable in RUN, max. 	499
— adjustable	Yes; From 10 to 499
— preset	10
Service data	
• can be read out	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Configuration	
Configuration software	
• STEP 7	Yes; V5.5 or higher
Programming	
Command set	see instruction list
Nesting levels	8
 System functions (SFC) 	see instruction list
 System function blocks (SFB) 	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	40 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	340 g



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