



SIMATIC S7-300 CPU 315-2 PN/DP, CENTRAL PROCESSING UNIT WITH 384 KBYTE WORKING MEMORY, 1. INTERFACE MPI/DP 12MBIT/S, 2. INTERFACE ETHERNET PROFINET, WITH 2 PORT SWITCH, MICRO MEMORY CARD NECESSARY

Product type designation	
General information	
Hardware product version	01
Firmware version	V3.2
Engineering with	
<ul style="list-style-type: none"> Programming package 	STEP7 V 5.5 or higher
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> 24 V DC 	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
External protection for supply cables (recommendation)	2 A min.
Mains buffering	
<ul style="list-style-type: none"> Mains/voltage failure stored energy time 	5 ms
<ul style="list-style-type: none"> 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
I^2t	1 A ² ·s
Power losses	
Power loss, typ.	4.65 W

Memory	
Work memory	
<ul style="list-style-type: none"> • Integrated 	384 kbyte
<ul style="list-style-type: none"> • expandable 	No
<ul style="list-style-type: none"> • Size of retentive memory for retentive data blocks 	128 kbyte
Load memory	
<ul style="list-style-type: none"> • pluggable (MMC) 	Yes
<ul style="list-style-type: none"> • pluggable (MMC), max. 	8 Mbyte
<ul style="list-style-type: none"> • Data management on MMC (after last programming), min. 	10 y
Backup	
<ul style="list-style-type: none"> • present 	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> • without battery 	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.05 μ s
for word operations, typ.	0.09 μ s
for fixed point arithmetic, typ.	0.12 μ s
for floating point arithmetic, typ.	0.45 μ s
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
<ul style="list-style-type: none"> • Number, max. 	1 024; Number range: 1 to 16000
<ul style="list-style-type: none"> • Size, max. 	64 kbyte
FB	
<ul style="list-style-type: none"> • Number, max. 	1 024; Number range: 0 to 7999
<ul style="list-style-type: none"> • Size, max. 	64 kbyte
FC	
<ul style="list-style-type: none"> • Number, max. 	1 024; Number range: 0 to 7999
<ul style="list-style-type: none"> • Size, max. 	64 kbyte
OB	
<ul style="list-style-type: none"> • Size, max. 	64 kbyte
<ul style="list-style-type: none"> • Number of free cycle OBs 	1; OB 1
<ul style="list-style-type: none"> • Number of time alarm OBs 	1; OB 10
<ul style="list-style-type: none"> • Number of delay alarm OBs 	2; OB 20, 21
<ul style="list-style-type: none"> • Number of time interrupt OBs 	4; OB 32, 33, 34, 35
<ul style="list-style-type: none"> • Number of process alarm OBs 	1; OB 40
<ul style="list-style-type: none"> • Number of DPV1 alarm OBs 	3; OB 55, 56, 57
<ul style="list-style-type: none"> • Number isochronous mode OBs 	1; OB 61
<ul style="list-style-type: none"> • Number of startup OBs 	1; OB 100

• Number of asynchronous error OBs	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
• Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
• per priority class	16
• additional within an error OB	4

Counters, timers and their retentivity

S7 counter

• Number	256
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Retentivity

— can be set	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7

Counting range

— can be set	Yes
— lower limit	0
— upper limit	999

IEC counter

• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)

S7 times

• Number	256
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Retentivity

— can be set	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity

Time range

— lower limit	10 ms
— upper limit	9 990 s

IEC timer

• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)

Data areas and their retentivity

Total retentive data area	All, 128 KB max.
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Flag

• Number, max.	2 048 byte
• Retentivity available	Yes; MB 0 to MB 2047
• Retentivity preset	MB 0 to MB 15

• Number of clock memories	8; 1 memory byte
Data blocks	
• Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
• 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	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; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
• Inputs	16 384
— Inputs, of which central	1 024
• Outputs	16 384
— Outputs, of which central	1 024
Analog channels	
• Inputs	1 024
— Inputs, of which central	256
• Outputs	1 024
— Outputs, of which central	256
Hardware configuration	
Expansion devices, max.	3
Number of DP masters	
• Integrated	1
• Via CP	4
Number of operable FMs and CPs (recommended)	

• FM	8
• CP, point-to-point	8
• CP, LAN	10
Rack	
• Racks, max.	4
• Modules per rack, max.	8
Time of day	
Clock	
• Hardware clock (real-time clock)	Yes
• battery-backed and synchronizable	Yes
• Deviation per day, max.	10 s; Typ.: 2 s
• Backup time	6 wk; At 40 °C ambient temperature
• 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	1
• Number/Number range	0
• Range of values	0 to 2 ³¹ hours (when using SFC 101)
• Granularity	1 hour
• 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 USB interfaces	0

Number of 20 mA interfaces (TTY)	0
Number of RS 232 interfaces	0
Number of RS 422 interfaces	0
Number of parallel interfaces	0
Number of other interfaces	1; Ethernet, 2-port switch, 2*RJ45

1st interface

Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA

Functionality

• MPI	Yes
• DP master	Yes
• DP slave	Yes
• Point-to-point connection	No

MPI

• Transmission rate, max.	12 Mbit/s
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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

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 mode support	Yes
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on 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.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
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
2nd interface	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
Integrated switch	Yes
Number of ports	2
Automatic detection of transmission speed	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Media redundancy	
• supported	Yes

• Switchover time on line break, typically	200 ms; PROFINET MRP
• Number of stations in the ring, max.	50
Functionality	
• MPI	No
• DP master	No
• DP slave	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	Yes
— Number of HTTP clients	5
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
• Number of connectable IO devices, max.	128
• Max. number of connectable IO devices for RT	128
— of which in line, max.	128
• Number of IO devices with IRT and the option "high flexibility"	128
— of which in line, max.	61
• Number of IO Devices with IRT and the option "high performance", max.	64
— of which in line, max.	64
• IRT	Yes
• Shared device	Yes
• Prioritized startup	Yes
— Number of IO Devices, max.	32
• Activation/deactivation of IO Devices	Yes
— Maximum number of IO devices that can be activated/deactivated at the same time.	8
• IO Devices changing during operation (partner ports), supported	Yes
— Max. number of IO devices per tool	8
• Device replacement without swap medium	Yes
• Send cycles	250 µs, 500 µs, 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)
Services	
— PG/OP communication	Yes
— Routing	Yes

— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
— Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 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: 14, max. number of instances: 32
— Isochronous mode	No
— Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
— IRT	Yes
— PROFINergy	Yes; With SFB 73 / 74 prepared for loadable PROFINergy 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.	8
• 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
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface
Communication functions	
PG/OP communication	Yes

Data record routing	Yes
Global data communication	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> Number of GD loops, max. 	8
<ul style="list-style-type: none"> Number of GD packets, max. 	8
<ul style="list-style-type: none"> Number of GD packets, transmitter, max. 	8
<ul style="list-style-type: none"> Number of GD packets, receiver, max. 	8
<ul style="list-style-type: none"> Size of GD packets, max. 	22 byte
<ul style="list-style-type: none"> Size of GD packet (of which consistent), max. 	22 byte
S7 basic communication	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> User data per job, max. 	76 byte
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> as server 	Yes
<ul style="list-style-type: none"> As client 	Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> supported 	Yes; via CP and loadable FC
Open IE communication	
<ul style="list-style-type: none"> TCP/IP <ul style="list-style-type: none"> Number of connections, max. Data length for connection type 01H, max. Data length for connection type 11H, max. Several passive connections per port, supported 	Yes; via integrated PROFINET interface and loadable FBs 8 1 460 byte 32 768 byte Yes
<ul style="list-style-type: none"> ISO-on-TCP (RFC1006) <ul style="list-style-type: none"> Number of connections, max. Data length, max. 	Yes; via integrated PROFINET interface and loadable FBs 8 32 768 byte
<ul style="list-style-type: none"> UDP <ul style="list-style-type: none"> Number of connections, max. Data length, max. 	Yes; via integrated PROFINET interface and loadable FBs 8 1 472 byte
Web server	
<ul style="list-style-type: none"> supported 	Yes
<ul style="list-style-type: none"> Number of HTTP clients 	5
<ul style="list-style-type: none"> User-defined websites 	Yes
PROFINET CBA (at set setpoint communication load)	
<ul style="list-style-type: none"> 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 frequency: Sampling time, min.	500 ms
— Number of incoming interconnections	100
— Number of outgoing interconnections	100
— 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.	1 400 byte
Remote interconnections with cyclic transmission	
— 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	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	14
— Reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	14
• usable for S7 communication	14
— reserved for S7 communication	0
— Adjustable for S7 communication, min.	0
— Adjustable for S7 communication, max.	14
• Max. total number of instances	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.	16; 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
• Force, variables	Inputs, outputs
• Number of variables, max.	10
Diagnostic buffer	
• present	Yes

- Number of entries, max.
 - can be set No
 - Of which powerfail-proof 100; Only the last 100 entries are retained
- Number of entries readable in RUN, max. 499
 - can be set Yes; From 10 to 499
 - preset 10

Service data	
• Can be read out	Yes

Ambient conditions	
Ambient temperature in 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

last modified: 12.03.2015