



SIMATIC S7-300 CPU 315-2 PN/DP, Central processing unit with 384 KB 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	
<ul style="list-style-type: none"> • Isochronous mode 	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
<ul style="list-style-type: none"> • Programming package 	STEP 7 V5.5 or higher
Supply voltage	
Rated value (DC)	24 V
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	
<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 loss	
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
Load memory	
<ul style="list-style-type: none"> • Plug-in (MMC) 	Yes
<ul style="list-style-type: none"> • Plug-in (MMC), max. 	8 Mbyte
<ul style="list-style-type: none"> • Data management on MMC (after last programming), min. 	10 a
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	
• Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
• 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	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
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— 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	256
Retentivity	
— adjustable	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	
Retentive data area (incl. timers, counters, flags), max.	128 kbyte
Flag	
• Size, max.	2 048 byte
• Retentivity available	Yes; MB 0 to MB 2 047

<ul style="list-style-type: none"> • Retentivity preset • Number of clock memories 	MB 0 to MB 15 8; 1 memory byte
Data blocks	
<ul style="list-style-type: none"> • Retentivity adjustable • Retentivity preset 	Yes; via non-retain property on DB Yes
Local data	
<ul style="list-style-type: none"> • per priority class, max. 	32 768 byte; Max. 2048 bytes per block
Address area	
I/O address area	
<ul style="list-style-type: none"> • Inputs • Outputs 	2 048 byte 2 048 byte
of which distributed	
<ul style="list-style-type: none"> — Inputs — Outputs 	2 048 byte 2 048 byte
Process image	
<ul style="list-style-type: none"> • Inputs • Outputs • Inputs, adjustable • Outputs, adjustable • Inputs, default • Outputs, default 	2 048 byte 2 048 byte 2 048 byte 2 048 byte 128 byte 128 byte
Subprocess images	
<ul style="list-style-type: none"> • Number of subprocess images, max. 	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
<ul style="list-style-type: none"> • Inputs <ul style="list-style-type: none"> — of which central • Outputs <ul style="list-style-type: none"> — of which central 	16 384 1 024 16 384 1 024
Analog channels	
<ul style="list-style-type: none"> • Inputs <ul style="list-style-type: none"> — of which central • Outputs <ul style="list-style-type: none"> — of which central 	1 024 256 1 024 256
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
<ul style="list-style-type: none"> • integrated • via CP 	1 4
Number of operable FMs and CPs (recommended)	
<ul style="list-style-type: none"> • FM • CP, PtP • CP, LAN 	8 8 10
Rack	
<ul style="list-style-type: none"> • Racks, max. • Modules per rack, max. 	4 8
Time of day	
Clock	
<ul style="list-style-type: none"> • Hardware clock (real-time) • retentive and synchronizable • Backup time • Deviation per day, max. • Behavior of the clock following POWER-ON • Behavior of the clock following expiry of backup period 	Yes Yes 6 wk; At 40 °C ambient temperature 10 s; Typ.: 2 s Clock continues running after POWER OFF the clock continues at the time of day it had when power was switched off
Operating hours counter	
<ul style="list-style-type: none"> • Number • Number/Number range • Range of values • Granularity • retentive 	1 0 0 to 2 ³¹ hours (when using SFC 101) 1 h 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
Isolated	Yes
Interface types	
• RS 485	Yes
• Output current of the interface, 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 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)	Yes; as subscriber

communication)	
— 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
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
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Interface types	
• RJ 45 (Ethernet)	Yes
• Number of ports	2
• integrated switch	Yes
Protocols	
• 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
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
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
— IRT	Yes
— Shared device	Yes
— Prioritized startup	Yes
— Number of IO devices with prioritized startup, max.	32
— 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 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)
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
— 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.	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
Protocols	
PROFIsafe	No
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
— Number of connections, max.	8
— 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, supported	Yes
● ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	8
— Data length, max.	32 768 byte

<ul style="list-style-type: none"> • UDP <ul style="list-style-type: none"> — Number of connections, max. — Data length, max. 	<p>Yes; via integrated PROFINET interface and loadable FBs</p> <p>8</p> <p>1 472 byte</p>
Web server	
<ul style="list-style-type: none"> • supported • User-defined websites • Number of HTTP clients 	<p>Yes</p> <p>Yes</p> <p>5</p>
communication functions / header	
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
<ul style="list-style-type: none"> • supported • Number of GD loops, max. • Number of GD packets, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. 	<p>Yes</p> <p>8</p> <p>8</p> <p>8</p> <p>8</p> <p>22 byte</p> <p>22 byte</p>
S7 basic communication	
<ul style="list-style-type: none"> • supported • User data per job, max. • User data per job (of which consistent), max. 	<p>Yes</p> <p>76 byte</p> <p>76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)</p>
S7 communication	
<ul style="list-style-type: none"> • supported • as server • as client • User data per job, max. 	<p>Yes</p> <p>Yes</p> <p>Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB</p> <p>See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)</p>
S5 compatible communication	
<ul style="list-style-type: none"> • supported 	Yes; via CP and loadable FC
communication functions / PROFINET CBA (with set target communication load) / header	
<ul style="list-style-type: none"> • Setpoint for the CPU communication load • number of remote connection partners / with PROFINET CBA • number of technological functions / with PROFINET CBA / for master or slave • number of connections / with PROFINET CBA / for master or slave / total • data volume / of the input variables / with PROFINET CBA / for master or slave • data volume / of the output variables / with PROFINET CBA / for master or slave • number of internal and PROFIBUS interconnections / with PROFINET CBA / maximum • data volume / of internal and PROFIBUS interconnections / with PROFINET CBA / for master or slave • data volume / with PROFINET CBA / per connection / maximum 	<p>50 %</p> <p>32</p> <p>30</p> <p>1 000</p> <p>4 000 byte</p> <p>4 000 byte</p> <p>500</p> <p>4 000 byte</p> <p>1 400 byte</p>
performance data / PROFINET CBA / remote interconnection / with acyclic transfer / header	
<ul style="list-style-type: none"> — update time / of the remote interconnections / in the case of acyclic transmission / with PROFINET CBA — number of remote connections to input variables / in the case of acyclic transmission / with PROFINET CBA / maximum — number of remote connections to output variables / in the case of acyclic transmission / with PROFINET CBA / maximum — data volume / as user data for remote interconnections with input variables / in the case of acyclic transmission / with PROFINET CBA — data volume / as user data for remote interconnections with output variables / in the case of acyclic transmission / with PROFINET CBA — data volume / as user data for remote interconnections / in the case of acyclic transmission / 	<p>500 ms</p> <p>100</p> <p>100</p> <p>2 000 byte</p> <p>2 000 byte</p> <p>1 400 byte</p>

with PROFINET CBA / per connection / maximum	
performance data / PROFINET CBA / remote interconnection / with cyclic transfer / header	
— update time / of the remote interconnections / with cyclical transfer / with PROFINET CBA	10 ms
— number of remote connections to input variables / with PROFINET CBA / with cyclic transfer / maximum	200
— number of remote connections to output variables / with cyclical transfer / with PROFINET CBA / maximum	200
— data volume / as user data for remote interconnections with input variables / with cyclical transfer / with PROFINET CBA / maximum	2 000 byte
— data volume / as user data for remote interconnections with output variables / with cyclical transfer / with PROFINET CBA / maximum	2 000 byte
— data volume / as user data for remote interconnections / with cyclical transfer / with PROFINET CBA / per connection / maximum	450 byte
performance data / PROFINET CBA / HMI variables via PROFINET / acyclic / header	
— number of connectable HMI stations / for HMI variables / in the case of acyclic transmission / with PROFINET CBA	3; 2x PN OPC/1x iMap
— update time / of the HMI variables / in the case of acyclic transmission / with PROFINET CBA	500 ms
— number of HMI variables / in the case of acyclic transmission / with PROFINET CBA / maximum	200
— data volume / as user data for HMI variables / in the case of acyclic transmission / with PROFINET CBA / maximum	2 000 byte
performance data / PROFINET CBA / PROFIBUS proxy functionality / header	
— product function / with PROFINET CBA / PROFIBUS proxy functionality	Yes
— number of coupled PROFIBUS devices / with PROFIBUS functionality	16
— data volume / with PROFIBUS proxy functionality / with PROFINET CBA / per connection / maximum	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
• 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.	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

<ul style="list-style-type: none"> • Variables 	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> • Number of variables, max. 	30
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — of which status variables, max. 	30
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — of which control variables, max. 	14
Forcing	
<ul style="list-style-type: none"> • Forcing 	Yes
<ul style="list-style-type: none"> • Forcing, variables 	Inputs, outputs
<ul style="list-style-type: none"> • Number of variables, max. 	10
Diagnostic buffer	
<ul style="list-style-type: none"> • present 	Yes
<ul style="list-style-type: none"> • Number of entries, max. 	500
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — adjustable 	No
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — of which powerfail-proof 	100; Only the last 100 entries are retained
<ul style="list-style-type: none"> • Number of entries readable in RUN, max. 	499
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — adjustable 	Yes; From 10 to 499
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — preset 	10
Service data	
<ul style="list-style-type: none"> • can be read out 	Yes
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> • min. 	0 °C
<ul style="list-style-type: none"> • max. 	60 °C
configuration / header	
Configuration software	
<ul style="list-style-type: none"> • STEP 7 	Yes; V5.5 or higher
configuration / programming / header	
<ul style="list-style-type: none"> • Command set 	see instruction list
<ul style="list-style-type: none"> • Nesting levels 	8
<ul style="list-style-type: none"> • System functions (SFC) 	see instruction list
<ul style="list-style-type: none"> • System function blocks (SFB) 	see instruction list
Programming language	
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — LAD 	Yes
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — FBD 	Yes
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — STL 	Yes
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — SCL 	Yes
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — CFC 	Yes
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — GRAPH 	Yes
<ul style="list-style-type: none"> <ul style="list-style-type: none"> — HiGraph® 	Yes
Know-how protection	
<ul style="list-style-type: none"> • User program protection/password protection 	Yes
<ul style="list-style-type: none"> • Block encryption 	Yes; With S7 block Privacy
Dimensions	
Width	40 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	340 g

last modified: 8/16/2023 