SIEMENS

Data sheet 6ES7318-3EL00-0AB0

Spare part SIMATIC S7-300 CPU 319-3 PN/DP, Central processing unit with 1.4MB memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP master/slave 3rd interface Ethernet PROFINET, Micro Memory Card required

General information	
HW functional status	09
Firmware version	V2.8
Product function	
● Isochronous mode	Yes; Via 2nd DP interface
Engineering with	
● Programming package	STEP 7 V5.4 + SP5 or higher or STEP 7 V5.4 + SP4 or higher with HSP 186
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.
Input current	
Current consumption (rated value)	1 050 mA
Current consumption (in no-load operation), typ.	400 mA
Inrush current, typ.	4 A
I^2t	1.2 $A^2 \cdot s$
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
● integrated	1 400 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.	0.01 µs
for word operations, typ.	0.02 µs
for fixed point arithmetic, typ.	0.02 µs
for floating point arithmetic, typ.	0.04 µs
CPU-blocks	
Number of blocks (total)	4 096; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.

DB	
● Number, max.	4 096; Number range: 1 to 16000
● Size, max.	64 kbyte
FB	
● Number, max.	4 096; Number range: 0 to 7999
● Size, max.	64 kbyte
FC	
● Number, max.	4 096; 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 (OB 35: smallest settable clock pulse = 500 µs)
● 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	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— 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	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— 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.	700 kbyte
Flag	
● Size, max.	8 192 byte
● Retentivity available	Yes; From MB 0 to MB 8 191
● 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
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	2
● 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
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
● Behavior of the clock following expiry of backup period	the clock continues at the time of day it had when power was switched off
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	
integrated channels (DI)	0
Digital outputs	
integrated channels (DO)	0
Analog inputs	
integrated channels (AI)	0
Analog outputs	
integrated channels (AO)	0
Interfaces	
Number of industrial Ethernet interfaces	1
Number of PROFINET interfaces	1
Number of RS 485 interfaces	2
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.	150 mA
Protocols	
● MPI	Yes
● PROFIBUS DP master	Yes
● PROFIBUS DP slave	Yes
● Point-to-point connection	No
MPI	
● Number of connections	32
● 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	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
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; with interface active
— 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	Integrated RS 485 interface
Isolated	Yes
Interface types	
● RS 485	Yes
● Output current of the interface, max.	200 mA
Protocols	
● MPI	No
● PROFINET IO Controller	No
● PROFINET IO Device	No
● PROFINET CBA	No
● PROFIBUS DP master	Yes
● PROFIBUS DP slave	Yes
● Open IE communication	No
● Web server	No
● Point-to-point connection	No
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; Connection configured on one side only
— 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
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	
● GSD file	The latest GSD file is available at: http://www.siemens.com/profibus-gsd
● 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; with interface active
— 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
3. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
● RJ 45 (Ethernet)	Yes
● Number of ports	1
● integrated switch	No
Protocols	
● MPI	No
● PROFINET IO Controller	Yes
● PROFINET IO Device	No
● 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; only read function
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: 16, max. number of instances: 32
— Isochronous mode	No
— Prioritized startup	Yes
— Number of IO devices with prioritized startup, max.	32
— Number of connectable IO Devices, max.	256
— Number of IO Devices with IRT and the option "high flexibility"	256
— of which in line, max.	61
— Number of connectable IO Devices for RT, max.	256
— of which in line, max.	256
— 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
— Updating time	250 µs - 128 ms (with send cycle of 250 µs); 500 µs - 256 ms (with send cycle of 500 µs); 1 ms - 512 ms (with send cycle 1 ms); minimum value of the send cycle is also dependent on the set communication share for PROFINET IO, on the number of I/O devices, and on the volume of configured user data.

Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
— User data consistency, max.	254 byte
PROFINET CBA	
● acyclic transmission	Yes
● cyclic transmission	Yes
Open IE communication	
● Number of connections, max.	32
● Local port numbers used at the system end	0, 20, 21, 23, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Protocols	
PROFIsafe	No
Open IE communication	
● TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	32
— Data length for connection type 01H, max.	1 460 byte
— Data length for connection type 11H, max.	8 192 byte
● ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	32
— Data length, max.	8 192 byte
● UDP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	32
— Data length, max.	1 472 byte
Web server	
● supported	Yes; only read function
● Number of HTTP clients	5
communication functions / header	
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	
● supported	Yes; via CP and loadable FC
communication functions / PROFINET CBA (with set target communication load) / header	
● Setpoint for the CPU communication load	20 %
● number of remote connection partners / with PROFINET CBA	32
● number of technological functions / with PROFINET CBA / for master or slave	50
● number of connections / with PROFINET CBA / for master or slave / total	3 000
● data volume / of the input variables / with PROFINET CBA / for master or slave	24 000 byte
● data volume / of the output variables / with PROFINET CBA / for master or slave	24 000 byte
● number of internal and PROFIBUS interconnections	1 000

/ with PROFINET CBA / maximum	
● data volume / of internal and PROFIBUS interconnections / with PROFINET CBA / for master or slave	8 000 byte
● data volume / with PROFINET CBA / per connection / maximum	1 400 byte
performance data / PROFINET CBA / remote interconnection / with acyclic transfer / header	
— update time / of the remote interconnections / in the case of acyclic transmission / with PROFINET CBA	200 ms
— number of remote connections to input variables / in the case of acyclic transmission / with PROFINET CBA / maximum	100
— number of remote connections to output variables / in the case of acyclic transmission / with PROFINET CBA / maximum	100
— data volume / as user data for remote interconnections with input variables / in the case of acyclic transmission / with PROFINET CBA	3 200 byte
— data volume / as user data for remote interconnections with output variables / in the case of acyclic transmission / with PROFINET CBA	3 200 byte
— data volume / as user data for remote interconnections / in the case of acyclic transmission / with PROFINET CBA / per connection / maximum	1 400 byte
performance data / PROFINET CBA / remote interconnection / with cyclic transfer / header	
— update time / of the remote interconnections / with cyclical transfer / with PROFINET CBA	1 ms
— number of remote connections to input variables / with PROFINET CBA / with cyclic transfer / maximum	300
— number of remote connections to output variables / with cyclical transfer / with PROFINET CBA / maximum	300
— data volume / as user data for remote interconnections with input variables / with cyclical transfer / with PROFINET CBA / maximum	4 800 byte
— data volume / as user data for remote interconnections with output variables / with cyclical transfer / with PROFINET CBA / maximum	4 800 byte
— data volume / as user data for remote interconnections / with cyclical transfer / with PROFINET CBA / per connection / maximum	250 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	600
— data volume / as user data for HMI variables / in the case of acyclic transmission / with PROFINET CBA / maximum	9 600 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	32
— data volume / with PROFIBUS proxy functionality / with PROFINET CBA / per connection / maximum	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
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
● Forcing, variables	Inputs, outputs
● Number of variables, max.	10
Diagnostic buffer	
● present	Yes
● Number of entries, max.	500
— adjustable	No
— of which powerfail-proof	100
● Number of entries readable in RUN, max.	
— 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 / header	
Configuration software	
● STEP 7	Yes; V5.4 SP4 or higher with HW update
configuration / programming / header	
● 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
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	1 250 g

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