



SIPLUS S7-300 CPU317-2PN/DP -25 ... +60 DEGREES C
 CONFORMITY WITH EN50155 T1 CAT 1 CL A/B WITH
 CONFORMAL COATING BASED ON 6ES7317-2EK14-0AB0
 . CENTRAL PROCESSING UNIT WITH 1 MB WORKING
 MEMORY,
 1. INTERFACE MPI/DP 12MBIT/S,
 2. INTERFACE ETHERNET PROFINET,
 WITH 2 PORT SWITCH,
 MICRO MEMORY CARD NECESSARY

General information	
Hardware product version	01
Firmware version	V3.2
Engineering with	
Programming package	STEP7 V 5.5 or higher
Supply voltage	
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.
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	
Type of memory	other

Work memory	
integrated	1024 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 a
Backup	
present	Yes ; Guaranteed by MMC (maintenance-free)
without battery	Yes ; Program and data
CPU processing times	
for bit operations, typ.	0.025 μ s
for word operations, typ.	0.03 μ s
for fixed point arithmetic, typ.	0.04 μ s
for floating point arithmetic, typ.	0.16 μ s
CPU-blocks	
Number of blocks (total)	2048 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	2048 ; Number range: 1 to 16000
Size, max.	64 kbyte
FB	
Number, max.	2048 ; Number range: 0 to 7999
Size, max.	64 kbyte
FC	
Number, max.	2048 ; 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 time 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 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
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	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	9990 s
IEC timer	
present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area, total	All, max. 256 KB
Flag	

Number, max.	4096 byte
Retentivity available	Yes ; From MB 0 to MB 4095
Retentivity preset	MB 0 to MB 15
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	2048 ; 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.	32768 byte ; Max. 2048 bytes per block
Address area	
I/O address area	
Inputs	8192 byte
Outputs	8192 byte
of which distributed	
Inputs	8192 byte
Outputs	8192 byte
Process image	
Inputs	8192 byte
Outputs	8192 byte
Inputs, adjustable	8192 byte
Outputs, adjustable	8192 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	65536
Outputs	65536
Inputs, of which central	1024
Outputs, of which central	1024
Analog channels	
Inputs	4096
Outputs	4096
Inputs, of which central	256
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	4
Number/Number range	0 to 3
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
Interfaces	
Number of USB interfaces	0
Number of parallel interfaces	0
Number of 20 mA interfaces (TTY)	0

Number of RS 232 interfaces	0
Number of RS 422 interfaces	0
Number of other interfaces	1 ; Ethernet, 2-port switch, 2*RJ45
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
Functionality	
MPI	Yes
DP master	Yes
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 ; Connection configured on one side only
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.	8 kbyte
Outputs, max.	8 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
2. Interface	
Interface type	PROFINET
Physics	Ethernet RJ45
isolated	Yes
integrated switch	Yes
Number of ports	2
automatic detection of transmission rate	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, typ.	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
Number of connectable IO Devices for RT, max.	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, supported	Yes
Shared device, supported	Yes
Prioritized startup supported	Yes
Number of IO Devices, max.	32
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)
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 on PROFIBUS DP or PROFINET IO
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
Address area	
Inputs, max.	8 kbyte
Outputs, max.	8 kbyte
User data consistency, max.	1024 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
Open IE communication	Yes ; Via TCP/IP, ISO on TCP, and UDP
IRT	Yes
PROFenergy, supported	Yes ; With SFB 73 / 74 prepared for loadable PROFenergy standard FB for I-Device
Shared device	Yes
Number of IO Controllers with shared device, max.	2
Transfer memory	
Inputs, max.	1440 byte ; Per IO Controller with shared device
Outputs, max.	1440 byte ; Per IO Controller with shared device
Submodules	
Number, max.	64
User data per submodule, max.	1024 byte
PROFINET CBA	
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	
Open IE communication, supported	Yes
Number of connections, max.	16
Local port numbers used at the system end	0, 20, 21, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
Isochronous mode	
Isochronous mode (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	
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
Open IE communication	
TCP/IP	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	16
Data length for connection type 01H, max.	1460 byte
Data length for connection type 11H, max.	32768 byte
Several passive connections per port, supported	Yes
ISO-on-TCP (RFC1006)	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	16
Data length, max.	32768 byte
UDP	Yes ; via integrated PROFINET interface and loadable FBs
Number of connections, max.	16
Data length, max.	1472 byte
Web server	
supported	Yes
Number of HTTP clients	5
User-defined websites	Yes

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	1000
Data length of all incoming connections master/slave, max.	4000 byte
Data length of all outgoing connections master/slave, max.	4000 byte
Number of device-internal and PROFIBUS interconnections	500
Data length of device-internal und PROFIBUS interconnections, max.	4000 byte
Data length per connection, max.	1400 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.	2000 byte
Data length of all outgoing interconnections, max.	2000 byte
Data length per connection, max.	1400 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.	2000 byte
Data length of all outgoing interconnections, max.	2000 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.	2000 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
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 ; 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
Isolation	
Isolation tested with	500V AC for 1 minute
Standards, approvals, certificates	
CE mark	Yes
EN 50155	Yes
Ambient conditions	
Operating temperature	
min.	-25 °C ; = Tmin
max.	60 °C ; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
Extended ambient conditions	
relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity	
with condensation, maximum	100 % ; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance	
to biologically active substances/conformity with EN 60721-3-3	Yes ; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
to chemically active substances/conformity with EN 60721-3-3	Yes ; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
to mechanically active substances/conformity with EN 60721-3-3	Yes ; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
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
Status	Aug 5, 2014