



SIMATIC S7-300 CPU317F-2 PN/DP,  
CENTRAL PROCESSING UNIT WITH 1.5 MBYTE  
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	1
Firmware version	V3.2
Engineering with	
Programming package	STEP 7 V 5.5 or higher, Distributed Safety V 5.4 SP4
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 supply cables (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
$I^2t$	1 A <sup>2</sup> ·s
Power losses	

<b>Power loss, typ.</b>	4.65 W
<b>Memory</b>	
<b>Work memory</b>	
<b>integrated</b>	1536 kbyte
<b>expandable</b>	No
<b>Size of retentive memory for retentive data blocks</b>	256 kbyte
<b>Load memory</b>	
<b>pluggable (MMC)</b>	Yes
<b>pluggable (MMC), max.</b>	8 Mbyte
<b>Data management on MMC (after last programming), min.</b>	10 a
<b>Backup</b>	
<b>present</b>	Yes ; Guaranteed by MMC (maintenance-free)
<b>without battery</b>	Yes ; Program and data
<b>CPU processing times</b>	
<b>for bit operations, typ.</b>	0.025 $\mu$ s
<b>for word operations, typ.</b>	0.03 $\mu$ s
<b>for fixed point arithmetic, typ.</b>	0.04 $\mu$ s
<b>for floating point arithmetic, typ.</b>	0.16 $\mu$ s
<b>CPU-blocks</b>	
<b>Number of blocks (total)</b>	2048 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
<b>DB</b>	
<b>Number, max.</b>	2048 ; Number range: 1 to 16000
<b>Size, max.</b>	64 kbyte
<b>FB</b>	
<b>Number, max.</b>	2048 ; Number range: 0 to 7999
<b>Size, max.</b>	64 kbyte
<b>FC</b>	
<b>Number, max.</b>	2048 ; Number range: 0 to 7999
<b>Size, max.</b>	64 kbyte
<b>OB</b>	
<b>Size, max.</b>	64 kbyte
<b>Number of free cycle OBs</b>	1 ; OB 1
<b>Number of time alarm OBs</b>	1 ; OB 10
<b>Number of delay alarm OBs</b>	2 ; OB 20, 21
<b>Number of time interrupt OBs</b>	4 ; OB 32, 33, 34, 35
<b>Number of process alarm OBs</b>	1 ; OB 40
<b>Number of DPV1 alarm OBs</b>	3 ; OB 55, 56, 57

<b>Number isochronous mode OBs</b>	1 ; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
<b>Number of startup OBs</b>	1 ; OB 100
<b>Number of asynchronous error OBs</b>	6 ; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
<b>Number of synchronous error OBs</b>	2 ; OB 121, 122
<b>Nesting depth</b>	
<b>per priority class</b>	16
<b>additional within an error OB</b>	4
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
<b>Number</b>	512
<b>Retentivity</b>	
<b>adjustable</b>	Yes
<b>lower limit</b>	0
<b>upper limit</b>	511
<b>preset</b>	Z 0 to Z 7
<b>Counting range</b>	
<b>adjustable</b>	Yes
<b>lower limit</b>	0
<b>upper limit</b>	999
<b>IEC counter</b>	
<b>present</b>	Yes
<b>Type</b>	SFB
<b>Number</b>	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
<b>Number</b>	512
<b>Retentivity</b>	
<b>adjustable</b>	Yes
<b>lower limit</b>	0
<b>upper limit</b>	511
<b>preset</b>	No retentivity
<b>Time range</b>	
<b>lower limit</b>	10 ms
<b>upper limit</b>	9990 s
<b>IEC timer</b>	
<b>present</b>	Yes
<b>Type</b>	SFB
<b>Number</b>	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	

<b>retentive data area, total</b>	All, max. 256 KB
<b>Flag</b>	
<b>Number, max.</b>	4096 byte
<b>Retentivity available</b>	Yes
<b>Retentivity preset</b>	MB 0 to MB 15
<b>Number of clock memories</b>	8 ; 1 memory byte
<b>Data blocks</b>	
<b>Number, max.</b>	2048 ; Number range: 1 to 16000
<b>Size, max.</b>	64 kbyte
<b>Retentivity adjustable</b>	Yes ; via non-retain property on DB
<b>Retentivity preset</b>	Yes
<b>Local data</b>	
<b>per priority class, max.</b>	32768 byte ; Max. 2048 bytes per block
<b>Address area</b>	
<b>I/O address area</b>	
<b>Inputs</b>	8192 byte
<b>Outputs</b>	8192 byte
<b>of which, distributed</b>	
<b>Inputs</b>	8192 byte
<b>Outputs</b>	8192 byte
<b>Process image</b>	
<b>Inputs</b>	8192 byte
<b>Outputs</b>	8192 byte
<b>Inputs, adjustable</b>	8192 byte
<b>Outputs, adjustable</b>	8192 byte
<b>Inputs, default</b>	256 byte
<b>Outputs, default</b>	256 byte
<b>Subprocess images</b>	
<b>Number of subprocess images, max.</b>	1 ; With PROFINET IO, the length of the user data is limited to 1600 bytes
<b>Digital channels</b>	
<b>Inputs</b>	65536
<b>Outputs</b>	65536
<b>Inputs, of which central</b>	1024
<b>Outputs, of which central</b>	1024
<b>Analog channels</b>	
<b>Inputs</b>	4096
<b>Outputs</b>	4096
<b>Inputs, of which central</b>	256

Outputs, of which central	256
<b>Hardware configuration</b>	
Expansion devices, max.	3
Racks, max.	4
Modules per rack, max.	8
<b>Number of DP masters</b>	
integrated	1
via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
FM	8
CP, point-to-point	8
CP, LAN	10
<b>Time of day</b>	
<b>Clock</b>	
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
<b>Operating hours counter</b>	
Number	4
Number/Number range	0 to 3
Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)
Granularity	1 hour
retentive	Yes ; Must be restarted at each restart
<b>Clock synchronization</b>	
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
<b>1st interface</b>	
Type of interface	Integrated RS 485 interface
Physics	RS 485

<b>Isolated</b>	Yes
<b>Power supply to interface (15 to 30 V DC), max.</b>	200 mA
<b>Functionality</b>	
<b>MPI</b>	Yes
<b>DP master</b>	Yes
<b>DP slave</b>	Yes
<b>Point-to-point connection</b>	No
<b>MPI</b>	
<b>Transmission rate, max.</b>	12 Mbit/s
<b>Services</b>	
<b>PG/OP communication</b>	Yes
<b>Routing</b>	Yes
<b>Global data communication</b>	Yes
<b>S7 basic communication</b>	Yes
<b>S7 communication</b>	Yes
<b>S7 communication, as client</b>	No ; but via CP and loadable FB
<b>S7 communication, as server</b>	Yes
<b>DP master</b>	
<b>Transmission rate, max.</b>	12 Mbit/s
<b>Number of DP slaves, max.</b>	124
<b>Services</b>	
<b>PG/OP communication</b>	Yes
<b>Routing</b>	Yes
<b>Global data communication</b>	No
<b>S7 basic communication</b>	Yes ; I blocks only
<b>S7 communication</b>	Yes
<b>S7 communication, as client</b>	No
<b>S7 communication, as server</b>	Yes
<b>Equidistance mode support</b>	Yes
<b>Isochronous mode</b>	Yes ; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
<b>SYNC/FREEZE</b>	Yes
<b>Activation/deactivation of DP slaves</b>	Yes
<b>Number of DP slaves that can be simultaneously activated/deactivated, max.</b>	8
<b>Direct data exchange (slave-to-slave communication)</b>	Yes ; As subscriber
<b>DPV1</b>	Yes
<b>Address area</b>	
<b>Inputs, max.</b>	8 kbyte

Outputs, max.	8 kbyte
<b>User data per DP slave</b>	
Inputs, max.	244 byte
Outputs, max.	244 byte
<b>DP slave</b>	
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
<b>Services</b>	
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
<b>Transfer memory</b>	
Inputs	244 byte
Outputs	244 byte
<b>2nd interface</b>	
Type of interface	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
<b>Media redundancy</b>	
supported	Yes
Switchover time on line break, typically	200 ms ; PROFINET MRP
Number of stations in the ring, max.	50
<b>Functionality</b>	
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
<b>PROFINET IO Controller</b>	
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, supported	Yes
Shared device, supported	Yes
Prioritized startup supported	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)
<b>Services</b>	
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



<b>Address area</b>	
<b>Inputs, max.</b>	8 kbyte
<b>Outputs, max.</b>	8 kbyte
<b>User data consistency, max.</b>	1024 byte
<b>PROFINET IO Device</b>	
<b>Services</b>	
<b>PG/OP communication</b>	Yes
<b>Routing</b>	Yes
<b>S7 communication</b>	Yes ; with loadable FBs, max. configurable connections: 16, max. number of instances: 32
<b>Isochronous mode</b>	No
<b>Open IE communication</b>	Yes ; Via TCP/IP, ISO on TCP, and UDP
<b>IRT, supported</b>	Yes
<b>PROFInergy, supported</b>	Yes ; With SFB 73 / 74 prepared for loadable PROFInergy standard FB for I-Device
<b>Shared device, supported</b>	Yes
<b>Number of IO controllers with shared device, max.</b>	2
<b>Transfer memory</b>	
<b>Inputs, max.</b>	1440 byte ; Per IO Controller with shared device
<b>Outputs, max.</b>	1440 byte ; Per IO Controller with shared device
<b>Submodules</b>	
<b>Number, max.</b>	64
<b>User data per submodule, max.</b>	1024 byte
<b>PROFINET CBA</b>	
<b>acyclic transmission</b>	Yes
<b>Cyclic transmission</b>	Yes
<b>Open IE communication</b>	
<b>Open IE communication, supported</b>	Yes
<b>Number of connections, max.</b>	16
<b>Local port numbers used at the system end</b>	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<b>Keep-alive function, supported</b>	Yes
<b>Isochronous mode</b>	
<b>Isochronous operation (application synchronized up to terminal)</b>	Yes ; Via PROFIBUS DP or PROFINET interface
<b>Communication functions</b>	
<b>PG/OP communication</b>	Yes
<b>Data record routing</b>	Yes
<b>Global data communication</b>	
<b>supported</b>	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
<b>S7 basic communication</b>	
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)
<b>S7 communication</b>	
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)
<b>S5-compatible communication</b>	
supported	Yes ; via CP and loadable FC
<b>Open IE communication</b>	
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
<b>Web server</b>	
supported	Yes
Number of HTTP clients	5
User-defined websites	Yes
<b>PROFINET CBA (at set setpoint communication load)</b>	
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
<b>Remote interconnections with acyclic transmission</b>	
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
<b>Remote interconnections with cyclic transmission</b>	
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
<b>HMI variables via PROFINET (acyclic)</b>	
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
<b>PROFIBUS proxy functionality</b>	
supported	Yes
Number of linked PROFIBUS devices	16
Data length per connection, max.	240 byte ; Slave-dependent
<b>Number of connections</b>	
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
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.
<b>S7 message functions</b>	
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
<b>Test commissioning functions</b>	
Status block	Yes ; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
<b>Status/control</b>	
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
<b>Forcing</b>	
Forcing	Yes
Force, variables	Inputs, outputs
Number of variables, max.	10
<b>Diagnostic buffer</b>	
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

<b>preset</b>	10
<b>Service data</b>	
<b>Can be read out</b>	Yes
<b>Ambient conditions</b>	
<b>Operating temperature</b>	
<b>Min.</b>	0 °C
<b>max.</b>	60 °C
<b>Configuration</b>	
<b>Configuration software</b>	
<b>STEP 7</b>	Yes ; V5.5 or higher
<b>programming</b>	
<b>Command set</b>	see instruction list
<b>Nesting levels</b>	8
<b>System functions (SFC)</b>	see instruction list
<b>System function blocks (SFB)</b>	see instruction list
<b>Programming language</b>	
<b>LAD</b>	Yes
<b>FBD</b>	Yes
<b>STL</b>	Yes
<b>SCL</b>	Yes
<b>CFC</b>	Yes
<b>GRAPH</b>	Yes
<b>HiGraph®</b>	Yes
<b>Know-how protection</b>	
<b>User program protection/password protection</b>	Yes
<b>Block encryption</b>	Yes ; With S7 block Privacy
<b>Dimensions</b>	
<b>Width</b>	40 mm
<b>Height</b>	125 mm
<b>Depth</b>	130 mm
<b>Weights</b>	
<b>Weight, approx.</b>	340 g
Status	Jan 30, 2014