



spare part SIMATIC S7-300, CPU 317TF-3 PN/DP, central processing unit for PLC, technology and safety tasks, 1.5 MB work memory, 1st interface MPI/DP 12 Mbps, 2nd interface DP (drive), 3rd interface Ethernet PROFINET with 2-port switch, integrated I/O for technology, front connector (1x 40-pole) and Micro Memory Card min. 8 MB required

General information	
Product type designation	CPU 317TF-3 PN/DP
HW functional status	01
Firmware version	CPU: V3.2; integrated technology V4.1.5
Product function	
• Isochronous mode	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
• Programming package	STEP 7 V5.5 SP2 or higher; S7-Technology option package V4.2 SP3 or higher, Distributed Safety V5.4 SP5 or higher, S7-F Configuration Pack V5.5 SP10 or higher
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Digital outputs	
— Rated value (DC)	24 V; 2L+
— Reverse polarity protection	No; 2L+
Input current	
Current consumption (rated value)	1 100 mA
Current consumption (in no-load operation), typ.	270 mA
Inrush current, typ.	6.5 A
I ² t	1 A ² ·s
Power loss	
Power loss, typ.	8.5 W
Memory	
Work memory	
• integrated	1 536 kbyte
• expandable	No
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 µs
for word operations, typ.	0.03 µs
for fixed point arithmetic, typ.	0.04 µs
for floating point arithmetic, typ.	0.16 µs
CPU-blocks	
Number of blocks (total)	2 048; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
• Number, max.	2 048; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	2 048; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
• Number, max.	2 048; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
• Number, max.	see instruction list
• 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 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
• Number of technology synchronous alarm OBs	1; OB 65
• 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
— 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
— 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.	256 kbyte
Flag	
• Size, max.	4 096 byte
• Retentivity available	Yes; From MB 0 to MB 4 095
• 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	1 024 byte
• Outputs, default	1 024 byte
Default addresses of the integrated channels	
— Digital inputs	66
— Digital outputs	66
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	65 536
— of which central	256
• Outputs	65 536
— of which central	256
Analog channels	
• Inputs	4 096
— of which central	64
• Outputs	4 096
— of which central	64
Hardware configuration	
Number of expansion units, max.	0
Number of DP masters	
• integrated	2; 1 DP and 1 DP (drive)
• via CP	2; for DP
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	8
Rack	
• Racks, max.	1
• Modules per rack, max.	8
Time of day	
Clock	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes

<ul style="list-style-type: none"> • Backup time • Deviation per day, max. • Behavior of the clock following POWER-ON • Behavior of the clock following expiry of backup period 	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 	4 0 to 3 0 to 2 ³¹ hours (when using SFC 101) 1 h Yes; Must be restarted at each restart
Clock synchronization	
<ul style="list-style-type: none"> • supported • to MPI, master • on MPI, device • to DP, master • on DP, device • in AS, master • in AS, device • on Ethernet via NTP 	Yes Yes Yes Yes Yes; Only time-of-day slave Yes Yes Yes; As client
Digital inputs	
Number of digital inputs	4
<ul style="list-style-type: none"> • of which inputs usable for technological functions 	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	4
— up to 60 °C, max.	4
vertical installation	
— up to 40 °C, max.	4
Input voltage	
<ul style="list-style-type: none"> • Rated value (DC) • for signal "0" • for signal "1" 	24 V -3 to +5V +15 to +30 V
Input current	
<ul style="list-style-type: none"> • for signal "1", typ. 	7 mA
Input delay (for rated value of input voltage)	
for technological functions	
— at "0" to "1", max.	10 µs; Typical
— at "1" to "0", max.	10 µs; Typical
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	1 000 m
Digital outputs	
Number of digital outputs	8
<ul style="list-style-type: none"> • of which high-speed outputs 	8
Functions	for technology functions, e.g. high-speed cam switch signals
Short-circuit protection	Yes
<ul style="list-style-type: none"> • Response threshold, typ. 	1 A
Limitation of inductive shutdown voltage to	48 V
Controlling a digital input	No
Switching capacity of the outputs	
<ul style="list-style-type: none"> • on lamp load, max. 	5 W
Load resistance range	
<ul style="list-style-type: none"> • lower limit • upper limit 	48 Ω 4 kΩ
Output voltage	
<ul style="list-style-type: none"> • for signal "0", max. • for signal "1", min. 	3 V; (2L+) Rated voltage -2.5 V
Output current	
<ul style="list-style-type: none"> • for signal "1" rated value 	0.5 A

• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
• for signal "0" residual current, max.	0.3 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.2 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	100 Hz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	4 A
— up to 60 °C, max.	3 A
all other mounting positions	
— up to 40 °C, max.	4 A
Integrated high-speed cams	
• Switching accuracy (+/-)	70 µs
Cable length	
• shielded, max.	1 000 m
Analog inputs	
Number of analog inputs	0
Encoder	
Connectable encoders	
• 2-wire sensor	No
Interfaces	
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.	200 mA
Protocols	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP device	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
• max. number of DP devices	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 devices	Yes
— max. number of DP devices that can be activated/deactivated at the same time	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 device	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP device	
• 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	Integrated RS 485 interface
Isolated	Yes
Interface types	
• RS 485	Yes
• Output current of the interface, max.	200 mA
Protocols	
• MPI	No
• PROFIBUS DP master	Yes; DP(DRIVE)-Master
• PROFIBUS DP device	No
• Point-to-point connection	No
PROFIBUS DP master	
• Transmission rate, max.	12 Mbit/s
• max. number of DP devices	64
Services	
— PG/OP communication	No
— Routing	No
— Global data communication	No
— S7 basic communication	No
— S7 communication	No
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	No

— activation/deactivation of DP devices	Yes
— DPV1	No
Address area	
— Inputs, max.	1 024 byte
— Outputs, max.	1 024 byte
User data per DP device	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP device	
• GSD file	http://support.automation.siemens.com in Product Support area
• Transmission rate, max.	12 Mbit/s
3. 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
• PROFIBUS DP master	No
• PROFIBUS DP device	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: 16, max. number of instances: 32
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
— 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 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
— 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.	8 kbyte

— Outputs, max.	8 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: 16, max. number of instances: 32
— Isochronous mode	No
— 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
Open IE communication	
• Number of connections, max.	16
• 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	Yes
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.	16
— 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.	16
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	16
— Data length, max.	1 472 byte
Web server	
• supported	Yes
• User-defined websites	Yes
• Number of HTTP clients	5
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


<ul style="list-style-type: none"> • User data per job, max. • User data per job (of which consistent), max. 	76 byte 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 • as server • as client • User data per job, max. 	Yes Yes Yes; via integrated PROFINET interface and loadable FB or via CP and loadable FB 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
Number of connections	
<ul style="list-style-type: none"> • overall • usable for PG communication <ul style="list-style-type: none"> — reserved for PG communication — adjustable for PG communication, min. — adjustable for PG communication, max. • usable for OP communication <ul style="list-style-type: none"> — reserved for OP communication — adjustable for OP communication, min. — adjustable for OP communication, max. • usable for S7 basic communication <ul style="list-style-type: none"> — reserved for S7 basic communication — adjustable for S7 basic communication, min. — adjustable for S7 basic communication, max. • usable for S7 communication <ul style="list-style-type: none"> — reserved for S7 communication — adjustable for S7 communication, min. — adjustable for S7 communication, max. • total number of instances, max. • usable for routing 	32 31 1 1 31 31 1 1 31 30 0 0 30 16 0 0 16 32 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; without continuation
Status/control	
<ul style="list-style-type: none"> • Status/control variable • Variables • Number of variables, max. <ul style="list-style-type: none"> — of which status variables, max. — of which control variables, max. 	Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14
Forcing	
<ul style="list-style-type: none"> • Forcing • Forcing, variables • Number of variables, max. 	Yes Inputs, outputs 10
Diagnostic buffer	
<ul style="list-style-type: none"> • present • Number of entries, max. <ul style="list-style-type: none"> — adjustable — of which powerfail-proof • Number of entries readable in RUN, max. <ul style="list-style-type: none"> — adjustable — preset 	Yes 500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10

Service data			
<ul style="list-style-type: none">• can be read out	Yes		
Interrupts/diagnostics/status information			
Alarms	No		
Diagnostics function	No		
Diagnostics indication LED			
<ul style="list-style-type: none">• Status indicator digital input (green)	Yes		
<ul style="list-style-type: none">• Status indicator digital output (green)	Yes		
Potential separation			
Potential separation digital inputs			
<ul style="list-style-type: none">• between the channels and backplane bus	Yes		
Potential separation digital outputs			
<ul style="list-style-type: none">• between the channels and backplane bus	Yes		
Isolation			
Isolation tested with	500 V DC		
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			
Configuration software			
<ul style="list-style-type: none">• STEP 7	Yes; STEP 7 V5.5 SP2 or higher and S7-Technology Option Package V4.2 SP3, S7 F Configuration Pack V5.5 SP10, S7 Distributed Safety Option Package V5.4 SP5		
Programming			
<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">— LAD	Yes		
<ul style="list-style-type: none">— FBD	Yes		
<ul style="list-style-type: none">— STL	Yes		
<ul style="list-style-type: none">— SCL	Yes		
<ul style="list-style-type: none">— CFC	Yes		
<ul style="list-style-type: none">— GRAPH	Yes		
<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	120 mm		
Height	125 mm		
Depth	130 mm		
Weights			
Weight, approx.	640 g		
Classifications			
		Version	Classification
	eClass	14	27-24-22-07
	eClass	12	27-24-22-07
	eClass	9.1	27-24-22-07
	eClass	9	27-24-22-07
	eClass	8	27-24-22-07
	eClass	7.1	27-24-22-07
	eClass	6	27-24-22-07
	ETIM	10	EC000236
	ETIM	9	EC000236

ETIM	8	EC000236
ETIM	7	EC000236
IDEA	4	3565
UNSPSC	15	32-15-17-05

Approvals / Certificates


General Product Approval

Manufacturer Declaration	Miscellaneous	China RoHS	 UL	Miscellaneous	 RCM
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EMV For use in hazardous locations

 RCM	 ATEX	FM	 UL	Miscellaneous	 IECEX
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For use in hazardous locations Functional Safety Maritime application

 ATEX	CCC-Ex	TUEV	Type Examination Certificate	 ABS	 BUREAU VERITAS
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Maritime application

 DNV	 LRS	NK / Nippon Kaiji Kyokai	 PRS	 RINA	CCS (China Classification Society)
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other Industrial Communication

 Profibus	PROFINET	PROFINET	 Profibus
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last modified: 4/7/2025 