SIEMENS

SIMATIC S7-300, CPU 317TF-3 PN/DP,
CENTRAL PROCESSING UNIT FOR PLC,
TECHNOLOGY AND SAFETY,
1,5 MBYTE WORKING MEMORY,
1. INTERFACE MPI/DP 12MBIT/S,
2. INTERFACE DP(DRIVE),
3. INTERFACE ETHERNET PROFINET WITH 2 PORT
SWITCH,
INTEGRATED I/O FOR TECHNOLOGY,
FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY
CARD MIN. 8 MB NECESSARY

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General information	
Hardware product version	01
Firmware version	CPU: V3.2; integrated technology V4.1.5
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	
24 V DC	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
External protection for supply cables (recommendation)	2 A min.
Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Load voltage L+	
Rated value (DC)	24 V ; 2L+
Reverse polarity protection	No ; 2L+

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Input current	
Current consumption (rated value)	1100 mA
Current consumption (in no-load operation), typ.	270 mA
Inrush current, typ.	6.5 A
I²t	1 A²·s

Power losses	
Power loss, typ.	8.5 W

Memory	
Type of memory	other

Work memory	
integrated	1536 kbyte
expandable	No
Size of retentive memory for retentive data blocks	256 kbyte

Load memory	
pluggable (MMC)	Yes
pluggable (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)	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	

	Description	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 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 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
	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	1024 byte
Outputs, default	1024 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	65536
Outputs	65536
Inputs, of which central	256
Outputs, of which central	256
Analog channels	
Inputs	4096
Outputs	4096
Inputs, of which central	64
Outputs, of which central	64
Hardware configuration	
Expansion devices, 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, point-to-point	8
CP, LAN	8
Rack	
Racks, max.	1
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)

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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
to DP, slave	Yes ; Only time-of-day slave
in AS, master	Yes
in AS, slave	Yes
on Ethernet via NTP	Yes ; As client
Digital inputs	
Number of digital inputs	4
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	
Rated value, DC	24 V
for signal "0"	-3 to +5 V
for signal "1"	15 to 30 V
Input current	
for signal "1", typ.	7 mA
Input delay (for rated value of input voltage)	
for counter/technological functions	
at "0" to "1", max.	10 µs ; Typical
at "1" to "0", max.	10 µs ; Typical
Cable length	
Cable length, shielded, max.	1000 m
Digital outputs	
Number of digital outputs	8
of which high-speed outputs	8
Functions	For technology functions, e.g. high-speed cam switch signals
Short-circuit protection	Yes

Response threshold, typ.	1,0 A
Limitation of inductive shutdown voltage to	48 V
Controlling a digital input	No
Switching capacity of the outputs	
Lamp load, max.	5 W
Load resistance range	
lower limit	48 Ω
upper limit	4 kΩ
Output voltage	
for signal "0", max.	3 V ; (2L+)
for signal "1", min.	Rated voltage -2.5 V
Output current	
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 2 outputs	
for increased power	No
for redundant control of a load	No
Switching frequency	
with resistive load, max.	100 Hz
with inductive load, max.	0.2 Hz ; to IEC 947-5-1, DC-13
on lamp load, max.	100 Hz
Aggregate current of 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	
Cable length, shielded, max.	1000 m
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	0
Encoder	

Connectable encoders	
2-wire sensor	No

Interfaces	
Number of RS 422 interfaces	0
Number of other interfaces	0

1st 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
2nd 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	No
DP master	Yes ; DP(DRIVE)-Master
DP slave	No

Point-to-point connection		No
DP master		
Transmission rate, max.		12 Mbit/s
Number of DP slaves, max.		64
Services		
PG/OP communication		No
Routing		No
Global data communication		No
S7 basic communication		No
S7 communication		No
Equidistance mode support		Yes
Isochronous mode		Yes
SYNC/FREEZE		No
Activation/deactivation of DP slaves		Yes
DPV1		No
Address area		
Inputs, max.		1024 byte
Outputs, max.		1024 byte
User data per DP slave		
Inputs, max.		244 byte
Outputs, max.		244 byte
DP slave		
GSD file		http://support.automation.siemens.com in Product Support area
Transmission rate, max.		12 Mbit/s
3rd interface		
Interface type		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
Media redundancy		
supported		Yes
Switchover time on line break, typically		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
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
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 performance", max.	64
of which in line, max.	64
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
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
PROFIenergy, supported	Yes ; With SFB 73 / 74 prepared for loadable PROFIenergy 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

Open IE communication

Open IE communication, supported	Yes
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

Isochronous mode

Isochronous operation (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

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

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	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.

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

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
Force, 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
Interrupts/diagnostics/status information	
Alarms	
Alarms	No
Diagnostic messages	
Diagnostic functions	No
Diagnostics indication LED	
Status indicator digital output (green)	Yes
Status indicator digital input (green)	Yes
Galvanic isolation	
Galvanic isolation digital inputs	
between the channels and the backplane bus	Yes
Galvanic isolation digital outputs	
between the channels and the backplane bus	Yes
Permissible potential difference	
between different circuits	75 VDC / 60 VAC
Isolation	
Isolation checked with	500 V DC
Ambient conditions	
Operating temperature	
Min.	0 °C
max.	60 °C
Configuration	
Configuration software	
STEP 7	Yes
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

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Know-how protection	
User program protection/password protection	Yes
Block encryption	Yes ; With S7 block Privacy
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	640 g
Status	Jun 28, 2014