SIEMENS

SIMATIC S7-300,
CPU 312 CPU WITH MPI INTERFACE,
INTEGRATED 24 V DC POWER SUPPLY 32 KBYTE
WORKING MEMORY,
MICRO MEMORY CARD NECESSARY

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General information

Hardware product version	01
Firmware version	V3.3
Engineering with	
Programming package	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 218
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.
Mains buffering	
Mains/voltage failure stored energy time	5 ms
Repeat rate, min.	1 s
Input current	
Current consumption (rated value)	650 mA
Current consumption (in no-load operation), typ.	140 mA
Inrush current, typ.	3.5 A
I²t	1 A²·s

Power losses	
Power loss, typ.	4 W

Memory	

Work memory	
integrated	32 kbyte
expandable	No
Size of retentive memory for retentive data blocks	32 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.	0.1 µs
for word operations, typ.	0.24 µs
for fixed point arithmetic, typ.	0.32 µs
for floating point arithmetic, typ.	1.1 µs

CPU-blocks	
Number of blocks (total)	1024 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.

DB	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	32 kbyte

FB	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	32 kbyte

FC	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	32 kbyte

OB	
Description	see instruction list
Size, max.	32 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 startup OBs	1 ; OB 100
Number of asynchronous error OBs	4 ; OB 80, 82, 85, 87
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	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
preset	Z 0 to Z 7
Counting range	
lower limit	0
upper limit	999
IEC counter	
present	Yes
Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	256
Retentivity	
adjustable	Yes
lower limit	0
upper limit	255
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 (incl. memory bits, times, counters)
Flag	

Number, max.	256 byte
Retentivity available	Yes ; MB 0 to MB 255
Retentivity preset	MB 0 to MB 15
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	32 kbyte
Retentivity adjustable	Yes ; via non-retain property on DB
Retentivity preset	Yes
Local data	
per priority class, max.	32 kbyte ; Max. 2 KB per block
Address area	
I/O address area	
Inputs	1024 byte
Outputs	1024 byte
Process image	
Inputs	1024 byte
Outputs	1024 byte
Inputs, adjustable	1024 byte
Outputs, adjustable	1024 byte
Inputs, default	128 byte
Outputs, default	128 byte
Digital channels	
Inputs	256
Outputs	256
Inputs, of which central	256
Outputs, of which central	256
Analog channels	
Inputs	64
Outputs	64
Inputs, of which central	64
Outputs, of which central	64
Hardware configuration	
Racks, max.	1
Modules per rack, max.	8
Expansion devices, max.	0
Number of DP masters	
integrated	0

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via CP	4
Number of operable FMs and CPs (recommended)	
FM	8
CP, point-to-point	8
CP, LAN	4
Time of day	
Clock	
Software clock	Yes
battery-backed and synchronizable	No ; Buffered No Can be synchronized Yes
Deviation per day, max.	10 s ; Typ.: 2 s
Behavior of the clock following POWER-ON	The clock continues at the time of day it had when power was switched off
Operating hours counter	
Number	1
Number/Number range	0
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
in AS, master	Yes
in AS, slave	No
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	0
1st interface	
Type of interface	Integrated RS 485 interface
Physics	RS 485
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
MPI	Yes
DP master	No

	DP slave	No
	Point-to-point connection	No
MPI		
	Transmission rate, max.	187.5 kbit/s
Services		
	PG/OP communication	Yes
	Routing	No
	Global data communication	Yes
	S7 basic communication	Yes
	S7 communication	Yes ; Only server, configured on one side
	S7 communication, as client	No
	S7 communication, as server	Yes
Communication functions		
	PG/OP communication	Yes
	Data record routing	No
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 CP and loadable FB
	User data per job, max.	180 byte ; With PUT/GET
	User data per job (of which consistent), max.	240 byte ; as server
S5-compatible communication		
	supported	Yes ; via CP and loadable FC
Number of connections		
	overall	6
	usable for PG communication	5

reserved for PG communication	1
Adjustable for PG communication, min.	1
Adjustable for PG communication, max.	5
usable for OP communication	5
reserved for OP communication	1
adjustable for OP communication, min.	1
adjustable for OP communication, max.	5
usable for S7 basic communication	2
Reserved for S7 basic communication	0
adjustable for S7 basic communication, min.	0
adjustable for S7 basic communication, max.	2
S7 message functions	
Number of login stations for message functions, max.	6 ; 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
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	

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Can be read out	Yes
Ambient conditions	
Operating temperature	
Min.	0 °C
max.	60 °C
Configuration	
Configuration software	
STEP 7	Yes ; V5.2 SP1 or higher with HW update
programming	
Command set	see instruction list
Nesting levels	8
Programming language	
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes
GRAPH	Yes
HiGraph®	Yes
Software libraries	
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
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
Weight	
Weight, approx.	270 g
Status	Feb 25, 2013