Data sheet

SIMATIC S7-300, CPU 312 Central processing unit with MPI, Integr. power supply 24 V DC, Work memory 32 KB, Micro Memory Card required



Figure similar

General information	
HW functional status	01
Firmware version	V3.3
Engineering with	
Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
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.
Mains buffering	
Mains/voltage failure stored energy time	5 ms
• Repeat rate, min.	1 s
Input current	

Current consumption (in no-load operation), typ. 140 mA Inrush current, typ. 3.5 A Prever loss Power loss, typ. 4 W Wermony Work memory 4 W Wern mory Work memory • integrated 32 kbyte • Size of retentive memory for retentive data blocks 32 kbyte • Size of retentive memory for retentive data blocks 32 kbyte • Plug-in (MMC) Yes • Plug-in (MMC) 8 Mbyte • Plug-in (MMC) 8 Mbyte • Data management on MMC (after last programming), min. 10 y Backup Yes; Guaranteed by MMC (maintenance-free) • present Yes; Guaranteed by MMC (maintenance-free) • without battery Yes; Program and data PUL processing times O.1 µs for bit operations, typ. 0.24 µs for for bit operations, typ. 0.24 µs for footing point arithmetic, typ. 1.1 µs CPU-blocks 1.1 µs Number of blocks (total) 1 024; Number range: 1 to 16000 Size, max. 32 kbyte		
Inrush current, typ. 3.5 A 1A*s		
Power loss Power loss, typ. Memory Work memory • integrated • expandable • expandable • Size of retentive memory for retentive data blocks Load memory • Plug-in (MMC) • P		
Power loss Power loss, typ. ### A W #		
Power loss, typ. 4 W	l ² t	1 A ² ·s
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Work memory 32 kbyte • expandable 32 kbyte • Size of retentive memory for retentive data blocks 32 kbyte Load memory • Plug-in (MMC) • Plug-in (MMC) Yes • Plug-in (MMC) 8 Mbyte • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), min. 10 y Backup Yes; Guaranteed by MMC (maintenance-free) • present Yes; Guaranteed by MMC (maintenance-free) • vithout battery Yes; Program and data CPU processing times 0.1 μs for bit 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) 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. DB • Number, max. 1 024; Number range: 1 to 16000 • Size, max. 1 024; Number range: 0 to 7999 • Size, max. 1 024; Number range: 0 to 7999 • Size, max. 1 024; Number range: 0 to 7999 • Size, max. 1 024; Numbe	Memory	
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Data management on MMC (after last programming), min. Backup	• Plug-in (MMC)	Yes
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Present vithout battery Yes; Program and data CPU processing times for bit operations, typ. 10.24 μs 10.32 μs 11.1 μs CPU-blocks Number of blocks (total) Number, max. Size, max. 10.24; Number range: 1 to 16000 Size, max. 10.24; Number range: 0 to 7999 Size, max. Size, max. 10.24; Number range: 0 to 7999 Size, max.	programming), min.	
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Number of blocks (total) 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. DB • Number, max. • Size, max. 1 024; Number range: 1 to 16000 32 kbyte FB • Number, max. • Size, max. 1 024; Number range: 0 to 7999 32 kbyte FC • Number, max. • Size, max. 1 024; Number range: 0 to 7999 32 kbyte FC • Number, max. • Size, max. 1 024; Number range: 0 to 7999 32 kbyte OB • Description • Size, max. 32 kbyte	for fixed point arithmetic, typ.	0.32 µs
Number of blocks (total) 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. DB Number, max. 1 024; Number range: 1 to 16000 32 kbyte FB Number, max. 1 024; Number range: 0 to 7999 32 kbyte FC Number, max. 1 024; Number range: 0 to 7999 32 kbyte FC Number, max. 1 024; Number range: 0 to 7999 32 kbyte FC Number, max. 2 kbyte OB Description See instruction list Size, max. 32 kbyte	for floating point arithmetic, typ.	1.1 µs
Number of blocks (total) 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. DB Number, max. 1 024; Number range: 1 to 16000 32 kbyte FB Number, max. 1 024; Number range: 0 to 7999 Size, max. 1 024; Number range: 0 to 7999 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	CPU-blocks	
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 Size, max. OB Description Size, max. 32 kbyte 32 kbyte 	FC	
OB	Number, max.	1 024; Number range: 0 to 7999
 ◆ Description see instruction list ◆ Size, max. 32 kbyte 	• Size, max.	32 kbyte
• Size, max. 32 kbyte	ОВ	
	Description	see instruction list
Number of free cycle OBs 1; OB 1	• Size, max.	32 kbyte
	Number of free cycle OBs	1; OB 1

Number of time alarm OBs	1: OB 10
• Number of time alarm Obs	1, 00 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 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
• Туре	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	9 990 s
IEC timer	
• present	Yes
• Туре	SFB
Number	Unlimited (limited only by RAM capacity)

•	Data areas ar	ia their r	etentivity
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retentive data area in 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	
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	1 024 byte
Outputs	1 024 byte
Process image	
• Inputs	1 024 byte
Outputs	1 024 byte
Inputs, adjustable	1 024 byte
 Outputs, adjustable 	1 024 byte
Inputs, default	128 byte
 Outputs, default 	128 byte
Digital channels	
• Inputs	256
— of which central	256
Outputs	256
— of which central	256
Analog channels	
• Inputs	64
— of which central	64
Outputs	64
— of which central	64
Hardware configuration	
Number of expansion units, max.	0
Number of DP masters	
• integrated	0
• via CP	4
Number of operable FMs and CPs (recommended)	
● FM	8
• CP, PtP	8
• CP, LAN	4
Rack	

Tracks, max.	· ·
Modules per rack, max.	8
Time of day	
Clock	
Software clock	Yes
• retentive 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 h
• 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
Digital inputs	
Number of digital inputs	0
Digital outputs	
Number of digital outputs	0
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	0
Interfaces	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
Protocols	

• Racks, max.

	W
• MPI	Yes
PROFIBUS DP master	No
PROFIBUS 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, 	0
min.	
 adjustable for S7 basic communication, 	2
max.	

— 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
	1 1 1 1 1 1 1 1 1 1 1 1 1

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
Ambient conditions	
Ambient temperature during operation	
• 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
System functions (SFC)	see instruction list
 System function blocks (SFB) 	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	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.	270 g
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