



Figure similar

Spare part SIMATIC S7-300, CPU 312C Compact CPU with MPI, 10 DI/6 DQ, 2 high-speed counters (10 kHz) Integr. power supply 24 V DC, Work memory 32 KB, Front connector (1x 40-pole) and Micro Memory Card required

General information	
HW functional status	01
Firmware version	V2.6
Engineering with	
• Programming package	STEP 7 V5.3 SP2 or higher with HW update
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Digital inputs	
— load voltage / at digital input / at DC / rated value	24 V
— Reverse polarity protection	Yes
Digital outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	No
Input current	
Current consumption (rated value)	500 mA
Current consumption (in no-load operation), typ.	60 mA
Inrush current, typ.	11 A
I^2t	0.7 A ² ·s
Digital outputs	
• from load voltage L+, max.	50 mA
Power loss	
Power loss, typ.	6 W
Memory	
Work memory	
• integrated	32 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	4 Mbyte
• Data management on MMC (after last programming), min.	10 a
Backup	

<ul style="list-style-type: none"> • present 	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> • without battery 	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.2 µs
for bit operations, max.	0.4 µs
for word operations, typ.	0.4 µs
for fixed point arithmetic, typ.	5 µs
for floating point arithmetic, typ.	6 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	
<ul style="list-style-type: none"> • Number, max. 	511; Number range: 1 to 511
<ul style="list-style-type: none"> • Size, max. 	16 kbyte
FB	
<ul style="list-style-type: none"> • Number, max. 	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> • Size, max. 	16 kbyte
FC	
<ul style="list-style-type: none"> • Number, max. 	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> • Size, max. 	16 kbyte
OB	
<ul style="list-style-type: none"> • Number, max. 	see instruction list
<ul style="list-style-type: none"> • Size, max. 	16 kbyte
<ul style="list-style-type: none"> • Number of free cycle OBs 	1; OB 1
<ul style="list-style-type: none"> • Number of time alarm OBs 	1; OB 10
<ul style="list-style-type: none"> • Number of delay alarm OBs 	1; OB 20
<ul style="list-style-type: none"> • Number of cyclic interrupt OBs 	1; OB 35
<ul style="list-style-type: none"> • Number of process alarm OBs 	1; OB 40
<ul style="list-style-type: none"> • Number of startup OBs 	1; OB 100
<ul style="list-style-type: none"> • Number of asynchronous error OBs 	4; OB 80, 82, 85, 87
<ul style="list-style-type: none"> • Number of synchronous error OBs 	2; OB 121, 122
Nesting depth	
<ul style="list-style-type: none"> • per priority class 	8
<ul style="list-style-type: none"> • additional within an error OB 	4
Counters, timers and their retentivity	
S7 counter	
<ul style="list-style-type: none"> • Number 	128
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	127
— preset	8
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
<ul style="list-style-type: none"> • present 	Yes
<ul style="list-style-type: none"> • Type 	SFB
<ul style="list-style-type: none"> • Number 	Unlimited (limited only by RAM capacity)
S7 times	
<ul style="list-style-type: none"> • Number 	128
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	127
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
<ul style="list-style-type: none"> • present 	Yes

• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	32 kbyte
Flag	
• Size, max.	128 byte
• Retentivity available	Yes; MB 0 to MB 127
• 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.	256 byte
Address area	
I/O address area	
• Inputs	1 kbyte
• Outputs	1 kbyte
Process image	
• Inputs	128 byte
• Outputs	128 byte
Default addresses of the integrated channels	
— Digital inputs	124.0 to 125.1
— Digital outputs	124.0 to 124.5
Digital channels	
• Inputs	266
— of which central	266
• Outputs	262
— of which central	262
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	none
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	4
Rack	
• Racks, max.	1
• Modules per rack, max.	8
Time of day	
Clock	
• Software clock	Yes
• retentive and synchronizable	No
• Deviation per day, max.	15 s
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
Digital inputs	
Number of digital inputs	10
• of which inputs usable for technological functions	8
integrated channels (DI)	10
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	10
— up to 60 °C, max.	5
vertical installation	
— up to 40 °C, max.	5
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms
— Rated value	3 ms
for technological functions	
— at "0" to "1", max.	48 µs
Cable length	
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m; for technological functions: No
for technological functions	
— shielded, max.	100 m
— unshielded, max.	not allowed
Digital outputs	
Number of digital outputs	6
• of which high-speed outputs	2
integrated channels (DO)	6
Short-circuit protection	Yes; Clocked electronically
• Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	500 mA
• for signal "1" permissible range, min.	5 mA
• for signal "1" permissible range, max.	0.6 A
• for signal "1" minimum load current	5 mA
• for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	Yes
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	100 Hz
• of the pulse outputs, with resistive load, max.	2.5 kHz
Total current of the outputs (per group)	

horizontal installation	
— up to 40 °C, max.	2 A
— up to 60 °C, max.	1.5 A
vertical installation	
— up to 40 °C, max.	1.5 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	
integrated channels (AI)	none
Analog outputs	
integrated channels (AO)	none
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
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
MPI	
• Cable length, max.	50 m; without repeater
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	No
Interface types	
• RS 485	Yes
• Output current of the interface, max.	200 mA
Protocols	
• MPI	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	No
MPI	
• Number of connections	6
• 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
— S7 communication, as client	No
— S7 communication, as server	Yes
Protocols	
PROFIsafe	No
communication functions / header	
PG/OP communication	Yes
Global data communication	
• supported	Yes
• Number of GD loops, max.	4
• Number of GD packets, max.	4
• Number of GD packets, transmitter, max.	4
• Number of GD packets, receiver, max.	4
• Size of GD packets, max.	22 byte
• Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
• communication function / S7 basic communication	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.	64 byte
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
• usable for routing	No
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.	20
Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	2
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.	100
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• Status indicator digital input (green)	Yes
• Status indicator digital output (green)	Yes
Integrated Functions	
Frequency measurement	Yes
• Number of frequency meters	2; 2 channels up to max. 10 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	No
PID controller	No
Number of pulse outputs	2; 2 channels pulse width modulation up to 2.5 kHz (see Manual "Technological Functions")
Limit frequency (pulse)	2.5 kHz
Potential separation	

Potential separation digital inputs	
• Potential separation digital inputs	Yes
• between the channels	No
• between the channels and backplane bus	Yes
Potential separation digital outputs	
• Potential separation digital outputs	Yes
• between the channels	No
• between the channels and backplane bus	Yes
Isolation	
Isolation tested with	600 V DC
configuration / header	
Configuration software	
• STEP 7	Yes; V5.3 SP2 with HW update
configuration / programming / header	
• 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
Dimensions	
Width	80 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	409 g
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