



Figure similar

Spare part SIMATIC S7-300, CPU 313C, Compact CPU with MPI, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 3 high-speed counters (30 kHz), Integr. power supply 24 V DC, work memory 64 KB, Front connector (2x 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	
— Rated value (DC)	24 V
— Reverse polarity protection	Yes
Digital outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	No
Analog outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	700 mA
Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	11 A
I ² t	0.7 A ² ·s
Digital inputs	
• from load voltage L+ (without load), max.	70 mA
Digital outputs	
• from load voltage L+, max.	100 mA
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
• integrated	64 kbyte

<ul style="list-style-type: none"> • expandable 	No
Load memory	
<ul style="list-style-type: none"> • Plug-in (MMC) • Plug-in (MMC), max. • Data management on MMC (after last programming), min. 	Yes 8 Mbyte 10 y
Backup	
<ul style="list-style-type: none"> • present • without battery 	Yes; Guaranteed by MMC (maintenance-free) Yes; Program and data
CPU processing times	
for bit operations, typ.	0.1 μ s
for bit operations, max.	0.2 μ s
for word operations, typ.	0.2 μ s
for fixed point arithmetic, typ.	2 μ s
for floating point arithmetic, typ.	3 μ s
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. • Size, max. 	511; Number range: 1 to 511 16 kbyte
FB	
<ul style="list-style-type: none"> • Number, max. • Size, max. 	1 024; Number range: 0 to 2047 16 kbyte
FC	
<ul style="list-style-type: none"> • Number, max. • Size, max. 	1 024; Number range: 0 to 2047 16 kbyte
OB	
<ul style="list-style-type: none"> • Size, max. • Number of free cycle OBs • Number of time alarm OBs • Number of delay alarm OBs • Number of cyclic interrupt OBs • Number of process alarm OBs • Number of startup OBs • Number of asynchronous error OBs • Number of synchronous error OBs 	16 kbyte 1; OB 1 1; OB 10 1; OB 20 1; OB 35 1; OB 40 1; OB 100 4; OB 80, 82, 85, 87 2; OB 121, 122
Nesting depth	
<ul style="list-style-type: none"> • per priority class • additional within an error OB 	8 4
Counters, timers and their retentivity	
S7 counter	
<ul style="list-style-type: none"> • Number 	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	8
Counting range	
— lower limit	0
— upper limit	999
IEC counter	
<ul style="list-style-type: none"> • present • Type • Number 	Yes SFB Unlimited (limited only by RAM capacity)
S7 times	
<ul style="list-style-type: none"> • 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
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	64 kbyte
Flag	
• Size, 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.	510 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 126.7
— Digital outputs	124.0 to 125.7
— Analog inputs	752 to 761
— Analog outputs	752 to 755
Digital channels	
• Inputs	1 016
— of which central	1 016
• Outputs	1 008
— of which central	1 008
Analog channels	
• Inputs	253
— of which central	253
• Outputs	250
— of which central	250
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	none
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	6
Rack	
• Racks, max.	4
• Modules per rack, max.	8; In rack 3 max. 7
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. 	6 wk; At 40 °C ambient temperature 10 s
Operating hours counter	
<ul style="list-style-type: none"> • Number • Number/Number range • Range of values • Granularity • retentive 	1 0 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 • to MPI, slave • in AS, master 	Yes Yes Yes Yes
Digital inputs	
Number of digital inputs	24
<ul style="list-style-type: none"> • of which inputs usable for technological functions 	12
integrated channels (DI)	24
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	24
— up to 60 °C, max.	12
vertical installation	
— up to 40 °C, max.	12
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. 	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.	16 µs
Cable length	
<ul style="list-style-type: none"> • shielded, max. • unshielded, max. 	1 000 m; 100 m for technological functions 600 m; for technological functions: No
for technological functions	
— shielded, max.	100 m
— unshielded, max.	not allowed
Digital outputs	
Number of digital outputs	16
<ul style="list-style-type: none"> • of which high-speed outputs 	4
integrated channels (DO)	16
Short-circuit protection	Yes; Clocked electronically
<ul style="list-style-type: none"> • Response threshold, typ. 	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
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 "1", min. 	L+ (-0.8 V)
Output current	
<ul style="list-style-type: none"> • for signal "1" rated value 	500 mA

<ul style="list-style-type: none"> • for signal "1" permissible range, min. 	5 mA
<ul style="list-style-type: none"> • for signal "1" permissible range, max. 	0.6 A
<ul style="list-style-type: none"> • for signal "1" minimum load current 	5 mA
<ul style="list-style-type: none"> • for signal "0" residual current, max. 	0.5 mA
Parallel switching of two outputs	
<ul style="list-style-type: none"> • for uprating 	No
<ul style="list-style-type: none"> • for redundant control of a load 	Yes
Switching frequency	
<ul style="list-style-type: none"> • with resistive load, max. 	100 Hz
<ul style="list-style-type: none"> • with inductive load, max. 	0.5 Hz
<ul style="list-style-type: none"> • on lamp load, max. 	100 Hz
<ul style="list-style-type: none"> • 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.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	1 000 m
<ul style="list-style-type: none"> • unshielded, max. 	600 m
Analog inputs	
Number of analog inputs	
<ul style="list-style-type: none"> • For voltage/current measurement 	4
<ul style="list-style-type: none"> • For resistance/resistance thermometer measurement 	1
integrated channels (AI)	4+1
permissible input voltage for current input (destruction limit), max.	5 V; Permanent
permissible input voltage for voltage input (destruction limit), max.	30 V; Permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA; Permanent
permissible input current for current input (destruction limit), max.	50 mA; Permanent
Electrical input frequency, max.	400 Hz
No-load voltage for resistance-type transmitter, typ.	2.5 V
Constant measurement current for resistance-type transmitter, typ.	1.8 to 3.3 mA
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
<ul style="list-style-type: none"> • Current 	Yes
<ul style="list-style-type: none"> • Resistance thermometer 	Yes; Pt 100 / 10 MΩ
<ul style="list-style-type: none"> • Resistance 	Yes
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> • 0 to +10 V 	Yes
— Input resistance (0 to 10 V)	100 kΩ
Input ranges (rated values), currents	
<ul style="list-style-type: none"> • 0 to 20 mA 	Yes
— Input resistance (0 to 20 mA)	100 Ω
<ul style="list-style-type: none"> • -20 mA to +20 mA 	Yes
— Input resistance (-20 mA to +20 mA)	100 Ω
<ul style="list-style-type: none"> • 4 mA to 20 mA 	Yes
— Input resistance (4 mA to 20 mA)	100 Ω
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> • Pt 100 	Yes
— Input resistance (Pt 100)	10 MΩ
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> • 0 to 600 ohms 	Yes
— Input resistance (0 to 600 ohms)	10 MΩ
Thermocouple (TC)	

Temperature compensation	
— parameterizable	No
Characteristic linearization	
• parameterizable	Yes; by software
— for resistance thermometer	Pt 100
Cable length	
• shielded, max.	100 m
Analog outputs	
Number of analog outputs	2
integrated channels (AO)	2
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	55 mA
Current output, no-load voltage, max.	17 V
Output ranges, voltage	
• 0 to 10 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes; Without compensation of the line resistances
• for voltage output four-wire connection	No
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 k Ω
• with voltage outputs, capacitive load, max.	0.1 μ F
• with current outputs, max.	300 Ω
• with current outputs, inductive load, max.	0.1 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	16 V; Permanent
• Current, max.	50 mA; Permanent
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	
Measurement principle	Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
• Integration time, parameterizable	Yes; 2,5 / 16,6 / 20 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz
• Time constant of the input filter	0.38 ms
• Basic execution time of the module (all channels released)	1 ms
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	1 ms
Settling time	
• for resistive load	0.6 ms
• for capacitive load	1 ms
• for inductive load	0.5 ms
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes; with external supply
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Without compensation of the line resistances
• for resistance measurement with three-wire	No

connection	
• for resistance measurement with four-wire connection	No
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.06 %
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.1 %
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.06 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	1 %
• Current, relative to input range, (+/-)	1 %
• Resistance, relative to input range, (+/-)	5 %
• Voltage, relative to output range, (+/-)	1 %
• Current, relative to output range, (+/-)	1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.7 %; Linearity error ±0.06 %
• Current, relative to input range, (+/-)	0.7 %; Linearity error ±0.06 %
• Resistance, relative to input range, (+/-)	3 %; Linearity error ±0.2 %
• Resistance thermometer, relative to input range, (+/-)	3 %
• Voltage, relative to output range, (+/-)	0.7 %
• Current, relative to output range, (+/-)	0.7 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	30 dB
• Common mode interference, min.	40 dB
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	8
• 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
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communication functions / header

PG/OP communication	Yes
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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

• 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.	64 byte

S5 compatible communication

• supported	Yes; via CP and loadable FC
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Number of connections

• overall	8
• usable for PG communication	7
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	7
• usable for OP communication	7
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	7
• usable for S7 basic communication	4
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	4
• usable for routing	No

S7 message functions

Number of login stations for message functions, max.	8; Depending on the configured connections for PG/OP and S7 basic communication
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Process diagnostic messages	Yes
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simultaneously active Alarm-S blocks, max.	20
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Test commissioning functions

Status block	Yes
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Single step	Yes
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Number of breakpoints	2
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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	
<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. 	Yes 100
Interrupts/diagnostics/status information	
Diagnostics indication LED	
<ul style="list-style-type: none"> • Status indicator digital input (green) • Status indicator digital output (green) 	Yes Yes
Integrated Functions	
Frequency measurement <ul style="list-style-type: none"> • Number of frequency meters 	Yes 3; 3 channels up to max. 30 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)
PID controller	Yes
Number of pulse outputs	3; 3 channels pulse width modulation up to max. 2.5 kHz (see "Technological Functions" manual)
Limit frequency (pulse)	2.5 kHz
Potential separation	
Potential separation digital inputs	
<ul style="list-style-type: none"> • Potential separation digital inputs • between the channels • between the channels and backplane bus 	Yes No Yes
Potential separation digital outputs	
<ul style="list-style-type: none"> • Potential separation digital outputs • between the channels • between the channels, in groups of • between the channels and backplane bus 	Yes Yes 8 Yes
Potential separation analog inputs	
<ul style="list-style-type: none"> • Potential separation analog inputs • between the channels • between the channels and backplane bus 	Yes; common for analog I/O No Yes
Potential separation analog outputs	
<ul style="list-style-type: none"> • Potential separation analog outputs • between the channels • between the channels and backplane bus 	Yes; common for analog I/O No Yes
Isolation	
Isolation tested with	600 V DC
configuration / header	
Configuration software	
<ul style="list-style-type: none"> • STEP 7 	Yes; V5.3 SP2 with HW update
configuration / programming / header	
<ul style="list-style-type: none"> • Command set • Nesting levels • System functions (SFC) • System function blocks (SFB) 	see instruction list 8 see instruction list see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
<ul style="list-style-type: none"> • User program protection/password protection 	Yes
Dimensions	
Width	120 mm

Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	660 g
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