



Spare part SIMATIC S7-300, CPU 314C-2 DP Compact CPU with MPI, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 4 high-speed counters (60 kHz), integrated DP interface, Integr. power supply 24 V DC, Work memory 96 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)	1 000 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	96 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes

<ul style="list-style-type: none"> • Plug-in (MMC), max. 	8 Mbyte
<ul style="list-style-type: none"> • 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.	0.1 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. 	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"> • 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 DPV1 alarm OBs 	3; OB 55, 56, 57
<ul style="list-style-type: none"> • Number of startup OBs 	1; OB 100
<ul style="list-style-type: none"> • Number of asynchronous error OBs 	5; OB 80, 82, 85, 86, 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 	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 	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 	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	
<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.	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
of which distributed	
— Inputs	979 byte
— Outputs	986 byte
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	7 856
— of which central	1 016
• Outputs	7 904
— of which central	1 008
Analog channels	
• Inputs	494
— of which central	253
• Outputs	495
— of which central	250
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	1
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	10
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
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 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	
<ul style="list-style-type: none"> supported to MPI, master to MPI, slave to DP, master to DP, slave in AS, master 	Yes Yes Yes Yes; With DP slave only slave clock Yes Yes
Digital inputs	
Number of digital inputs	24
<ul style="list-style-type: none"> of which inputs usable for technological functions integrated channels (DI) 	16 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.	8 µs
Cable length	
<ul style="list-style-type: none"> shielded, max. unshielded, max. 	1 000 m; 50 m for technological functions 600 m; for technological functions: No
for technological functions	
— shielded, max.	50 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 for signal "1" permissible range, min. for signal "1" permissible range, max. for signal "1" minimum load current for signal "0" residual current, max. 	500 mA 5 mA 0.6 A 5 mA 0.5 mA
Parallel switching of two outputs	
<ul style="list-style-type: none"> for uprating for redundant control of a load 	No Yes
Switching frequency	
<ul style="list-style-type: none"> with resistive load, max. with inductive load, max. 	100 Hz 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	
<ul style="list-style-type: none"> • parameterizable 	Yes; by software
— for resistance thermometer	Pt 100
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	100 m
Analog outputs	
Number of analog outputs	
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	

<ul style="list-style-type: none"> • 0 to 10 V • -10 V to +10 V 	Yes
Output ranges, current	Yes
<ul style="list-style-type: none"> • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA 	Yes
Connection of actuators	Yes
<ul style="list-style-type: none"> • for voltage output two-wire connection • for voltage output four-wire connection • for current output two-wire connection 	Yes; Without compensation of the line resistances
Load impedance (in rated range of output)	No
<ul style="list-style-type: none"> • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, inductive load, max. 	Yes
Destruction limits against externally applied voltages and currents	1 kΩ
<ul style="list-style-type: none"> • Voltages at the outputs towards MANA • Current, max. 	0.1 μF
Cable length	300 Ω
<ul style="list-style-type: none"> • shielded, max. 	0.1 mH
Analog value generation for the inputs	
Measurement principle	16 V; Permanent
Integration and conversion time/resolution per channel	50 mA; Permanent
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) 	200 m
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	Actual value encryption (successive approximation)
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Conversion time (per channel) 	12 bit
Settling time	Yes; 2,5 / 16,6 / 20 ms
<ul style="list-style-type: none"> • for resistive load • for capacitive load • for inductive load 	400 / 60 / 50 Hz
Encoder	0.38 ms
Connection of signal encoders	1 ms
<ul style="list-style-type: none"> • for voltage measurement • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection 	0.6 ms
Connectable encoders	1 ms
<ul style="list-style-type: none"> • 2-wire sensor — permissible quiescent current (2-wire sensor), max. 	0.5 ms
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	2; MPI and PROFIBUS DP
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	12
• Transmission rate, max.	187.5 kbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
2. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Number of connection resources	12
Interface types	
• RS 485	Yes
• Output current of the interface, max.	200 mA
Protocols	
• MPI	No
• PROFINET IO Controller	No
• PROFINET CBA	No
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
PROFIBUS DP master	
• Number of connections, max.	12; For PG/OP communication
• Transmission rate, max.	12 Mbit/s

• Number of DP slaves, max.	32
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	Yes
— Isochronous mode	No
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	Yes
Address area	
— Inputs, max.	1 kbyte
— Outputs, max.	1 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
• Number of connections	12
• GSD file	The latest GSD file is available at: http://www.siemens.com/profibus-gsd
• 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
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
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	
• 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

<ul style="list-style-type: none"> • User data per job, max. 	180 kbyte; With PUT/GET
<ul style="list-style-type: none"> • User data per job (of which consistent), max. 	64 byte
S5 compatible communication	
<ul style="list-style-type: none"> • supported 	Yes; via CP and loadable FC
Number of connections	
<ul style="list-style-type: none"> • overall 	12
<ul style="list-style-type: none"> • usable for PG communication 	11
<ul style="list-style-type: none"> — reserved for PG communication 	1
<ul style="list-style-type: none"> — adjustable for PG communication, min. 	1
<ul style="list-style-type: none"> — adjustable for PG communication, max. 	11
<ul style="list-style-type: none"> • usable for OP communication 	11
<ul style="list-style-type: none"> — reserved for OP communication 	1
<ul style="list-style-type: none"> — adjustable for OP communication, min. 	1
<ul style="list-style-type: none"> — adjustable for OP communication, max. 	11
<ul style="list-style-type: none"> • usable for S7 basic communication 	8
<ul style="list-style-type: none"> — reserved for S7 basic communication 	0
<ul style="list-style-type: none"> — adjustable for S7 basic communication, min. 	0
<ul style="list-style-type: none"> — adjustable for S7 basic communication, max. 	8
<ul style="list-style-type: none"> • usable for routing 	4; max.
S7 message functions	
Number of login stations for message functions, max.	12; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	40
Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	2
Status/control	
<ul style="list-style-type: none"> • Status/control variable 	Yes
<ul style="list-style-type: none"> • Variables 	Inputs, outputs, memory bits, DB, times, counters
<ul style="list-style-type: none"> • Number of variables, max. 	30
<ul style="list-style-type: none"> — of which status variables, max. 	30
<ul style="list-style-type: none"> — of which control variables, max. 	14
Forcing	
<ul style="list-style-type: none"> • Forcing 	Yes
<ul style="list-style-type: none"> • Forcing, variables 	Inputs, outputs
<ul style="list-style-type: none"> • Number of variables, max. 	10
Diagnostic buffer	
<ul style="list-style-type: none"> • present 	Yes
<ul style="list-style-type: none"> • Number of entries, max. 	100
Interrupts/diagnostics/status information	
Diagnostics indication LED	
<ul style="list-style-type: none"> • Status indicator digital input (green) 	Yes
<ul style="list-style-type: none"> • Status indicator digital output (green) 	Yes
Integrated Functions	
Frequency measurement	Yes
<ul style="list-style-type: none"> • Number of frequency meters 	4; up to 60 kHz (see "Technological Functions" manual)
controlled positioning	Yes
integrated function blocks (closed-loop control)	PID controller (see "Technological Functions" manual)
PID controller	Yes
Number of pulse outputs	4; Pulse width modulation up to 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 	Yes
<ul style="list-style-type: none"> • between the channels 	No
<ul style="list-style-type: none"> • between the channels and backplane bus 	Yes
Potential separation digital outputs	
<ul style="list-style-type: none"> • Potential separation digital outputs 	Yes
<ul style="list-style-type: none"> • between the channels 	Yes
<ul style="list-style-type: none"> • between the channels, in groups of 	8

• between the channels and backplane bus	Yes
Potential separation analog inputs	
• Potential separation analog inputs	Yes; common for analog I/O
• between the channels	No
• between the channels and backplane bus	Yes
Potential separation analog outputs	
• Potential separation analog outputs	Yes; common for analog I/O
• 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
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
• User program protection/password protection	Yes
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	676 g
last modified:	10/25/2022 