

\*\*\* SPARE PART\*\*\* SIMATIC S7-300, CPU 313C-2 PTP COMPACT CPU WITH MPI, 16 DI/16 DO, 3 FAST COUNTERS (30 KHZ), INTEGRATED INTERFACE RS485, INTEGRATED 24V DC POWER SUPPLY, 64 KBYTE WORKING MEMORY, FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY CARD REQUIRED



Figure similar

General information	
Hardware product version	01
Firmware version	V2.6
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.3 SP2 or higher with HW update
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	Yes
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+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>permissible range, lower limit (DC)</li> <li>permissible range, upper limit (DC)</li> </ul>	24 V 20.4 V 28.8 V
Digital inputs	

<b>Load voltage L+</b>	
— Rated value (DC)	24 V
— Reverse polarity protection	Yes
<b>Digital outputs</b>	
<b>Load voltage L+</b>	
— Rated value (DC)	24 V
— Reverse polarity protection	No
<b>Input current</b>	
Current consumption (rated value)	700 mA
Current consumption (in no-load operation), typ.	100 mA
Inrush current, typ.	11 A
$I^2t$	0.7 A <sup>2</sup> ·s
<b>Digital inputs</b>	
• from load voltage L+ (without load), max.	70 mA
<b>Digital outputs</b>	
• from load voltage L+, max.	100 mA
<b>Power loss</b>	
Power loss, typ.	10 W
<b>Memory</b>	
<b>Work memory</b>	
• integrated	64 kbyte
• expandable	No
<b>Load memory</b>	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
• Data management on MMC (after last programming), min.	10 y
<b>Backup</b>	
• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data
<b>CPU processing times</b>	
for bit operations, typ.	0.1 μs
for bit operations, max.	0.2 μs
for word operations, typ.	0.2 μs
for fixed point arithmetic, typ.	2 μs
for floating point arithmetic, typ.	3 μs
<b>CPU-blocks</b>	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
<b>DB</b>	
• Number, max.	511; Number range: 1 to 511

• Size, max.	16 kbyte
<b>FB</b>	
• Number, max.	1 024; Number range: 0 to 2047
• Size, max.	16 kbyte
<b>FC</b>	
• Number, max.	1 024; Number range: 0 to 2047
• Size, max.	16 kbyte
<b>OB</b>	
• Size, max.	16 kbyte
• Number of free cycle OBs	1; OB 1
• Number of time alarm OBs	1; OB 10
• Number of delay alarm OBs	1; OB 20
• Number of cyclic interrupt OBs	1; OB 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
<b>Nesting depth</b>	
• per priority class	8
• additional within an error OB	4
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
of which retentive without battery	
— can be set	Yes
— lower limit	0
— upper limit	255
— preset	8
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	8
<b>Counting range</b>	
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	

• Number	256
of which retentive without battery	
— adjustable	Yes
— lower limit	0
— upper limit	255
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)
<b>Data areas and their retentivity</b>	
retentive data area in total	all
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.	511; Number range: 1 to 511
• Size, max.	16 kbyte
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
Local data	
• per priority class, max.	510 byte
<b>Address area</b>	
I/O address area	
• Inputs	1 kbyte
• Outputs	1 kbyte
of which distributed	
— Inputs	none
— Outputs	none
Process image	
• Inputs	128 byte
• Outputs	128 byte

<b>Default addresses of the integrated channels</b>	
— Digital inputs	124.0 to 125.7
— Digital outputs	124.0 to 125.7
<b>Digital channels</b>	
• Inputs	1 008
— of which central	1 008
• Outputs	1 008
— of which central	1 008
<b>Analog channels</b>	
• Inputs	248
— of which central	248
• Outputs	248
— of which central	248
<b>Hardware configuration</b>	
Number of expansion units, max.	3
<b>Number of DP masters</b>	
• integrated	No
• via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	8
• CP, PtP	8
• CP, LAN	6
<b>Rack</b>	
• Racks, max.	4
• Modules per rack, max.	8; In rack 3 max. 7
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 s
<b>Operating hours counter</b>	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)
• Granularity	1 hour
• retentive	Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes

- in AS, master

Yes

## Digital inputs

Number of digital inputs	16
<ul style="list-style-type: none"> <li>• of which inputs usable for technological functions</li> </ul>	12
integrated channels (DI)	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Number of simultaneously controllable inputs</b>	
horizontal installation	
— up to 40 °C, max.	16
— up to 60 °C, max.	8
vertical installation	
— up to 40 °C, max.	8
<b>Input voltage</b>	
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• for signal "0"</li> </ul>	-3 to +5V
<ul style="list-style-type: none"> <li>• for signal "1"</li> </ul>	+15 to +30V
<b>Input current</b>	
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	9 mA
<b>Input delay (for rated value of input voltage)</b>	
for standard inputs	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms
— Rated value	3 ms
for counter/technological functions	
— at "0" to "1", max.	16 µs
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m; 100 m for technological functions
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	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"> <li>• of which high-speed outputs</li> </ul>	4
integrated channels (DO)	16
Short-circuit protection	Yes; Clocked electronically
<ul style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
<b>Switching capacity of the outputs</b>	

• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	4 kΩ
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• 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
<b>Parallel switching of two outputs</b>	
• for uprating	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• 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
<b>Total current of the outputs (per group)</b>	
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
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Analog inputs</b>	
integrated channels (AI)	none
<b>Analog outputs</b>	
integrated channels (AO)	none
<b>Encoder</b>	
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	0

Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	1; RS 422/485 combined
<b>MPI</b>	
• Cable length, max.	50 m; without repeater
<b>Point-to-point</b>	
• Cable length, max.	1 200 m
<b>Integrated protocol driver</b>	
— 3964 (R)	Yes
— ASCII	Yes
— RK512	No
<b>Transmission rate, RS 422/485</b>	
— with 3964 (R) protocol, max.	38.4 kbit/s half duplex; 19.2 kbit/s full duplex
— with ASCII protocol, max.	38.4 kbit/s half duplex; 19.2 kbit/s full duplex

<b>1. Interface</b>	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
<b>Functionality</b>	
• MPI	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	No
<b>MPI</b>	
• Number of connections	8
• Transmission rate, max.	187.5 kbit/s
<b>Services</b>	
— 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

<b>2. Interface</b>	
Interface type	Integrated RS 422/ 485 interface
Physics	RS 422/RS 485 (X.27)
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	No
Number of connection resources	none
<b>Functionality</b>	



• MPI	No
• PROFINET IO Controller	No
• PROFINET CBA	No
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	Yes
<b>Point-to-point connection</b>	
• Transmission rate, max.	38.4 kbit/s half duplex; 19.2 kbit/s full duplex
• Interface controllable from the user program	Yes
• Interface can trigger alarm/interrupt in the user program	Yes; Message on break - identification
<b>Communication functions</b>	
PG/OP communication	Yes
<b>Global data communication</b>	
• 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
<b>S7 basic communication</b>	
• supported	Yes; Server
• 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)
<b>S7 communication</b>	
• 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
<b>S5 compatible communication</b>	
• supported	Yes; via CP and loadable FC
<b>Number of connections</b>	
• 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
- adjustable for OP communication, min.
- adjustable for OP communication, max.
- usable for S7 basic communication
  - reserved for S7 basic communication
  - adjustable for S7 basic communication, min.
  - adjustable for S7 basic communication, max.
- usable for routing

1  
1  
7  
4  
0  
0  
4  
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
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
- Variables
- Number of variables, max.
  - of which status variables, max.
  - of which control variables, max.

Yes  
Inputs, outputs, memory bits, DB, times, counters  
30  
30  
14

#### Forcing

- Forcing
- Forcing, variables
- Number of variables, max.

Yes  
Inputs, outputs  
10

#### Diagnostic buffer

- present
- Number of entries, max.

Yes  
100

### Interrupts/diagnostics/status information

#### Diagnostics indication LED

- Status indicator digital input (green)
- Status indicator digital output (green)

Yes  
Yes

### Integrated Functions

Number of counters	3; 3 channels (see "Technological Functions" manual)
Counting frequency (counter) max.	30 kHz
Frequency measurement	Yes

Number of frequency meters	3; 3 channels up to max. 30 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	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	
• 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	Yes
• between the channels, in groups of	8
• between the channels and backplane bus	Yes

### Permissible potential difference

between different circuits	75 V DC/60 V AC
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### Isolation

Isolation tested with	600 V DC
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### Configuration

Configuration software	
• STEP 7	Yes; V5.2 SP1 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

### Dimensions

Width	120 mm
Height	125 mm
Depth	130 mm

### Weights

Weight, approx.	566 g
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**last modified:** 03/23/2017