

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, 32 KBYTE WORKING MEMORY, FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY CARD REQUIRED

General information	
Hardware product version	01
Firmware version	V2.0.0
Engineering with	
<ul style="list-style-type: none"> Programming package 	STEP 7 V5.2 SP1 or higher (with STEP 7 V5.1 SP3 or higher, please use predecessor CPU)
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> 24 V DC 	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Load voltage L+	
<ul style="list-style-type: none"> Rated value (DC) 	24 V
<ul style="list-style-type: none"> permissible range, lower limit (DC) 	20.4 V
<ul style="list-style-type: none"> permissible range, upper limit (DC) 	28.8 V
Input current	
Current consumption (rated value)	700 mA
Current consumption (in no-load operation), typ.	100 mA
Inrush current, typ.	11 A
Power loss	
Power loss, typ.	10 W
Memory	
Work memory	
<ul style="list-style-type: none"> integrated 	32 kbyte; For program and data
<ul style="list-style-type: none"> expandable 	No
Load memory	
<ul style="list-style-type: none"> 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 y
Backup	
<ul style="list-style-type: none"> present 	Yes; Guaranteed by MMC (maintenance-free)

- without battery

Yes; Program and data

CPU processing times

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

CPU-blocks

Number of blocks (total)	1 024; (DBs, FCs, FBs OBs, SDBs); the maximum number of loadable blocks can be reduced by the MMC being used.
DB	
• Number, max.	511; Number range: 1 to 511
• Size, max.	16 kbyte
FB	
• Number, max.	512; Number range: 0 to 2047
• Size, max.	16 kbyte
FC	
• Number, max.	512; Number range: 0 to 2047
• Size, max.	16 kbyte
OB	
• Number, max.	see instruction list
• 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	1; OB 80
• Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
• per priority class	8
• additional within an error OB	4

Counters, timers and their retentivity

S7 counter	
• Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	256
Counting range	

— lower limit	0
— upper limit	999
IEC counter	
• Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	256
— 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 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; from DB1 to DB511
• Size, max.	16 kbyte
• Retentivity adjustable	No
• 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 125.7

— Digital outputs	124.0 to 125.7
Digital channels	
• Inputs	1 008
— of which central	992
• Outputs	1 008
— of which central	992
Analog channels	
• Inputs	248
— of which central	248
• Outputs	124
— of which central	248
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	No
• 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
• 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 hour
• 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	16
integrated channels (DI)	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	8 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms
for counter/technological functions	
— at "0" to "1", max.	8 µs
Cable length	
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m
Digital outputs	
Number of digital outputs	16
integrated channels (DO)	16
Short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	L+ (-48 V)
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" permissible range, max.	500 mA
• for signal "1" permissible range for 0 to 60 °C, max.	500 mA
• for signal "1" minimum load current	5 mA
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
Total current of the outputs (per group)	
all mounting positions	
— up to 40 °C, max.	8 A
— up to 60 °C, max.	4 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	

integrated channels (AI)	none
Encoder	
Connectable encoders	
<ul style="list-style-type: none"> • 2-wire sensor — permissible quiescent current (2-wire sensor), max. 	Yes 1.5 mA
Interfaces	
MPI	
<ul style="list-style-type: none"> • Cable length, max. 	50 m; without repeater
Point-to-point	
<ul style="list-style-type: none"> • Cable length, max. 	1 200 m
Integrated protocol driver	
— 3964 (R)	Yes
— ASCII	Yes
— RK512	No
Transmission rate, RS 422/485	
— with 3964 (R) protocol, max.	19.2 kbit/s
— with ASCII protocol, max.	19.2 kbit/s
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
Functionality	
<ul style="list-style-type: none"> • MPI • PROFIBUS DP master • PROFIBUS DP slave • Point-to-point connection 	Yes No No No
MPI	
<ul style="list-style-type: none"> • Number of connections • Transmission rate, max. 	8 187.5 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
2. Interface	

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
Functionality	
• MPI	No
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	Yes
Point-to-point connection	
• 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
Communication functions	
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; 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)
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	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 4
 - 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
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

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, in groups of | 16 |
| • between the channels and backplane bus | Yes |

Potential separation digital outputs

- | | |
|--|-----|
| • Potential separation digital outputs | Yes |
| • between the channels, in groups of | 8 |
| • between the channels and backplane bus | Yes |

Configuration

Configuration software

- | | |
|----------|---------------|
| • STEP 7 | Yes; V5.1 SP2 |
|----------|---------------|

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
-----------------	-------

last modified: 08/12/2017