

# SIEMENS

## Product data sheet

**6ES7313-6CG04-0AB0**

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

Product version	
Hardware product version	01
Firmware version	V3.3
General information	
associated programming package	STEP7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 203
Supply voltage	
Input voltage	
24 V DC	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for supply cables (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
Digital inputs	
Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Load voltage L+	
Rated value (DC)	24 V
Reverse polarity protection	No
Input current	
Current consumption (rated value)	800 mA

Current consumption (in no-load operation), typ.	110 mA
Inrush current, typ.	5 A
$I^2t$	0.7 A <sup>2</sup> ·s
<b>Digital inputs</b>	
from load voltage L+ (without load), max.	80 mA
<b>Digital outputs</b>	
from load voltage L+, max.	50 mA
<b>Power losses</b>	
Power loss, typ.	9 W
<b>Memory</b>	
<b>Work memory</b>	
integrated	128 Kibyte
expandable	No
Size of retentive memory for retentive data blocks	64 Kibyte
<b>Load memory</b>	
pluggable (MMC)	Yes
pluggable (MMC), max.	8 Mbyte
Data management on MMC (after last programming), min.	10 a
<b>Backup</b>	
present	Yes ; guaranteed by MMC (maintenance-free)
without battery	Yes ; Program and data
<b>CPU-blocks</b>	
Number of blocks (total)	1024 ; (DBs, FCs, FBs) the maximum number of loadable blocks can be reduced by the MMC used.
<b>DB</b>	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 Kibyte
<b>FB</b>	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	64 Kibyte
<b>FC</b>	
Number, max.	1024 ; Number range: 0 to 7999
Size, max.	64 Kibyte

OB	
Description	See instruction list
Size, max.	64 Kibyte
Number of free cycle OBs	1 ; OB 1
Number of time alarm OBs	1 ; OB 10
Number of delay alarm OBs	2 ; OB 20, 21
Number of time alarm OBs	4 ; OB 32, 33, 34, 35
Number of process alarm OBs	1 ; OB 40
Number of DPV1 alarm OBs	3 ; OB 55, 56, 57
Number of startup OBs	1 ; OB 100
Number of asynchronous error OBs	5 ; OB 80, 82, 85, 86, 87
Number of synchronous error OBs	2 ; OB 121, 122
Nesting depth	
per priority class	16
additional within an error OB	4
CPU processing times	
for bit operations, min.	0.07 $\mu$ s
for word operations, min.	0.15 $\mu$ s
for fixed point arithmetic, min.	0.2 $\mu$ s
for floating point arithmetic, min.	0.72 $\mu$ s
Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
can be set	Yes
lower limit	0
upper limit	255
preset	Z 0 to Z 7
Counting range	
lower limit	0
upper limit	999
IEC counter	
present	Yes

Type	SFB
Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
Number	256
<b>Retentivity</b>	
can be set	Yes
lower limit	0
upper limit	255
preset	no retentivity
<b>Time range</b>	
lower limit	10 ms
upper limit	9990 s
<b>IEC timer</b>	
present	Yes
Type	SFB
Number	unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
retentive data area, total	All, max. 64 KB
<b>Flag</b>	
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
<b>Data blocks</b>	
Number, max.	1024 ; Number range: 1 to 16000
Size, max.	64 Kibyte
Retentivity adjustable	Yes ; via non-retain property on DB
Retentivity preset	yes
<b>Local data</b>	
per priority class, max.	32 Kibyte ; 2048 bytes max. per block
<b>Address area</b>	
<b>I/O address area</b>	
Inputs	2048 byte

Outputs	2048 byte
of which, distributed	
Inputs	2030 byte
Outputs	2030 byte
<b>Process image</b>	
Inputs	2048 byte
Outputs	2048 byte
Inputs, adjustable	2048 byte
Outputs, adjustable	2048 byte
Inputs, default	128 byte
Outputs, default	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>	
integrated channels (DI)	16
integrated channels (DO)	16
Inputs	16256
Outputs	16256
Inputs, of which central	1008
Outputs, of which central	1008
<b>Analog channels</b>	
Integrated channels (AI)	0
Integrated channels (AO)	0
Inputs	1015
Outputs	1015
Inputs, of which central	248
Outputs, of which central	248
<b>Hardware configuration</b>	
Racks, max.	4
Modules per rack, max.	8 ; in rack 3 max. 7
Expansion devices, max.	3
<b>Number of DP masters</b>	

integrated	1
via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
FM	8
CP, point-to-point	8
CP, LAN	6
<b>Time of day</b>	
<b>Clock</b>	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Deviation per day, max.	10 s ; Typ.: 2 s
Backup time	6 wk ; (at 40 °C ambient temperature)
Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
Behavior of the clock following expiry of backup period	The clock continues at the time of day it had when power was switched off
<b>Runtime meter</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
to DP, master	Yes ; on DP slave only time-of-day slave
to DP, slave	Yes
in AS, master	Yes
in AS, slave	No
<b>Digital inputs</b>	
Number of digital inputs	16
of which, inputs usable for technological functions	12
<b>Number of simultaneously controllable inputs</b>	
horizontal installation	

up to 40 °C, max.	16
up to 60 °C, max.	8
<b>vertical installation</b>	
up to 40 °C, max.	8
<b>Technological functions</b>	
shielded, max.	100 m ; At maximum count frequency
unshielded, max.	not allowed
<b>Standard DI</b>	
shielded, max.	1000 m
unshielded, max.	600 m
Input characteristic curve acc. to IEC 1131, Type 1	Yes
<b>Input voltage</b>	
Rated value, DC	24 V
for signal "0"	-3 to +5 V
for signal "1"	15 to 30 V
<b>Input current</b>	
for signal "1", typ.	8 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
parameterizable	Yes ; 0.1 / 0.3 / 3 / 15 ms (You can reconfigure the input delay of the standard inputs during program runtime. Please note that under certain circumstances your newly set filter time may not be effective until the next filter cycle.)
Rated value	3 ms
<b>for counter/technological functions</b>	
at "0" to "1", max.	16 µs ; Minimum pulse width/minimum pause between pulses at maximum counting frequency
<b>Cable length</b>	
Cable length, shielded, max.	1000 m ; 100 m for technological functions
Cable length unshielded, max.	600 m ; For technological functions: No
<b>Digital outputs</b>	
Number of digital outputs	16
of which high-speed outputs	4 ; Notice: You cannot connect the fast outputs of your CPU in parallel

Short-circuit protection	Yes ; Clocked electronically
Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Lamp load, max.	5 W
Controlling a digital input	Yes
<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 2 outputs</b>	
for increased power	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>Aggregate current of outputs (per group)</b>	
<b>horizontal installation</b>	
up to 40 °C, max.	3 A
up to 60 °C, max.	2 A
<b>vertical installation</b>	
up to 40 °C, max.	2 A
<b>Load resistance range</b>	
lower limit	48 Ω
upper limit	4 kΩ
<b>Cable length</b>	
Cable length, shielded, max.	1000 m
Cable length unshielded, max.	600 m



Encoder	
Connectable encoders	
2-wire BEROS	Yes
permissible quiescent current (2-wire BEROS), max.	1.5 mA
Interfaces	
Number of parallel interfaces	0
Number of 20 mA interfaces (TTY)	0
Number of RS 232 interfaces	0
Number of RS 422 interfaces	0
Number of other hardware interfaces	0
1st interface	
Type of interface	Integrated RS 485 interface
Physics	RS 485
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
MPI	Yes
DP master	No
DP slave	No
Point-to-point connection	No
MPI	
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	Yes
S7 basic communication	Yes
S7 communication	Yes ; Only server, configured on one side only
S7 communication, as client	No ; (but via CP and loadable FBs)
S7 communication, as server	Yes
Transmission rate, max.	187.5 kbit/s
2nd interface	
Type of interface	integrated RS 485 interface
Physics	RS 485

Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
<b>Functionality</b>	
MPI	No
DP master	Yes
DP slave	Yes
PROFINET IO Controller	No
PROFINET IO Device	No
PROFINET CBA	No
<b>DP master</b>	
<b>Services</b>	
PG/OP communication	Yes
Routing	Yes
Global data communication	No
S7 basic communication	Yes ; I blocks only
S7 communication	Yes ; Yes (only server; connection configured at one end)
S7 communication, as client	No
S7 communication, as server	Yes
Equidistance mode support	Yes
Isochronous mode	No
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Number of DP slaves that can be simultaneously activated/deactivated, max.	8
Direct data exchange (slave-to-slave communication)	Yes ; As subscriber
DPV1	Yes
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	124
<b>Address area</b>	
Inputs, max.	2 Kibyte
Outputs, max.	2 Kibyte
<b>User data per DP slave</b>	

Inputs, max.	244 byte
Outputs, max.	244 byte
<b>DP slave</b>	
<b>Services</b>	
PG/OP communication	Yes
Routing	Yes ; Only with active interface
Global data communication	No
S7 basic communication	No
S7 communication	Yes ; Yes (only server; connection configured at one end)
S7 communication, as client	No
S7 communication, as server	Yes
Direct data exchange (slave-to-slave communication)	Yes
DPV1	No
GSD file	The latest GSD file is available on the Internet ( <a href="http://www.siemens.com/profibus-gsd">http://www.siemens.com/profibus-gsd</a> )
Transmission rate, max.	12 Mbit/s
Automatic baud rate search	Yes ; only with passive interface
<b>Transfer memory</b>	
Inputs	244 byte
Outputs	244 byte
Address area, max.	32
User data per address area, max.	32 byte
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
supported	Yes
Number of GD loops, max.	8
Number of GD packets, max.	8
Number of GD packets, transmitter, max.	8
Number of GD packets, receiver, max.	8
Size of GD packets, max.	22 byte

Size of GD packet (of which consistent), max.	22 byte
<b>S7 basic communication</b>	
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)
<b>S7 communication</b>	
supported	Yes
as server	Yes
as client	Yes ; via CP and loadable FB
User data per job, max.	180 Kibyte ; With PUT/GET
User data per job (of which consistent), max.	240 byte ; as server
<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	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	4 ; max.
<b>S7 message functions</b>	
Number of login stations for message functions, max.	8 ; Depending on the connections configured for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	300

Test commissioning functions	
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
Force, variables	Inputs, outputs
Number of variables, max.	10
Status block	Yes ; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	
present	Yes
Number of entries, max.	500
can be set	No
Of which powerfail-proof	100 ; Only the last 100 entries are retained
Number of entries readable in RUN, max.	499
adjustable	Yes ; From 10 to 499
preset	10
Service data	
can be read out	Yes
Interrupts/diagnostics/status information	
Diagnostics indication LED	
Status indicator digital output (green)	Yes
Status indicator digital input (green)	Yes
Integrated Functions	
Number of counters	3 ; see "Technological Functions" manual
Counter frequency (counter) max.	30 kHz
Frequency measurement	Yes
Number of frequency meters	3 ; up to 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 ; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz
<b>Galvanic isolation</b>	
<b>Galvanic isolation digital inputs</b>	
Galvanic isolation digital inputs	Yes
between the channels	No
between the channels and the backplane bus	Yes
<b>Galvanic isolation digital outputs</b>	
Galvanic isolation digital outputs	Yes
between the channels	Yes
between the channels, in groups of	8
between the channels and the backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 VDC / 60 VAC
<b>Isolation</b>	
Isolation checked with	600 VDC
<b>Ambient conditions</b>	
<b>Operating temperature</b>	
Min.	0 °C
max.	60 °C
<b>Configuration</b>	
<b>Configuration software</b>	
STEP 7	Yes ; STEP7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 203
STEP 7 Lite	No
<b>programming</b>	
<b>Programming language</b>	
LAD	Yes
FBD	Yes

STL	Yes
SCL	Yes
CFC	Yes
GRAPH	Yes
HiGraph®	Yes
Command set	see instruction list
Nesting levels	8
<b>Software libraries</b>	
System functions (SFC)	see instruction list
System function blocks (SFB)	see instruction list
<b>Know-how protection</b>	
User program protection/password protection	Yes
Block encryption	Yes ; with S7 block privacy
<b>Dimensions and weight</b>	
<b>Dimensions</b>	
Width	80 mm
Height	125 mm
Depth	130 mm
<b>Weight</b>	
Weight, approx.	500 g
Status	May 23, 2011