## SIEMENS

## Data sheet

## 6ES7313-6BG04-0AB0



SIMATIC S7-300, CPU 313C-2 PTP Compact CPU with MPI, 16 DI/16 DO, 3 high-speed counters (30 kHz), integrated interface RS485, Integr. power supply 24 V DC, work memory 128 KB, Front connector (1x 40-pole) and Micro Memory Card required

General information	
Firmware version	V3.3
Engineering with	
<ul> <li>Programming package</li> </ul>	STEP 7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 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
Mains buffering	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
Repeat rate, min.	1 s
Load voltage L+	
Digital inputs	
— Rated value (DC)	24 V
<ul> <li>Reverse polarity protection</li> </ul>	Yes
Digital outputs	
— Rated value (DC)	24 V
<ul> <li>Reverse polarity protection</li> </ul>	No
Input current	
Current consumption (rated value)	580 mA
Current consumption (in no-load operation), typ.	110 mA
Inrush current, typ.	5 A
l²t	0.7 A <sup>2</sup> ·s
Digital inputs	
<ul> <li>from load voltage L+ (without load), max.</li> </ul>	80 mA
Digital outputs	
<ul> <li>from load voltage L+, max.</li> </ul>	50 mA
Power loss	
Power loss, typ.	9 W
Memory	
Work memory	
integrated	128 kbyte
• expandable	No
Load memory	
Plug-in (MMC)	Yes
- · · ·	

- Diversity (MMAC) move	
Plug-in (MMC), max.	8 Mbyte
<ul> <li>Data management on MMC (after last programming), min.</li> </ul>	10 y
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.07 µs
for word operations, typ. for fixed point arithmetic, typ.	0.15 μs 0.2 μs
for floating point arithmetic, typ.	0.2 μs 0.72 μs
CPU-blocks	0.72 µs
	4 004 (DDs. EQs. EDs.) the mentioner number of herdelik blacks are
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
Number, max.	see instruction list
• Size, max.	64 kbyte
Number of free cycle OBs	1; OB 1
Number of time alarm OBs	1; OB 10
<ul> <li>Number of delay alarm OBs</li> </ul>	2; OB 20, 21
Number of cyclic interrupt OBs	4; OB 32, 33, 34, 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
Nesting depth	
<ul> <li>per priority class</li> </ul>	16
additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	256
Retentivity	
— adjustable	Yes
— lower limit	0

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Time: rangeImage: second s	— upper limit	255
<ul> <li>- Lower limit</li> <li>upper limit</li> <li>9 980 s</li> <li>IEC timer</li> <li>rippe</li> <li>File</li> <li>Number</li> <li>Unlimited (limited only by RAM capacity)</li> <li>Data areas and their retentivity</li> <li>Retentivity available</li> <li>Siza, max.</li> <li>Siza, Siza, max.</li> <li>Siza, Siza, Siza,</li></ul>	· · · · · · · · · · · · · · · · · · ·	No retentivity
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IEC stress       Yes         • present       Yes         • Type       Unlimited (limited only by RAM capacity)         Data areas and their retentivity         Retentive data area (incl. timers. counters, flags), max.       64 byte         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       Ves: Va non-retain property on DB         • Retentivity preset       Yes         • Retentivity adjustable       Yes         • Inputs       1024 byte         • Outputs, distable       1024 byte         • Outputs, default       128 byte <t< td=""><td></td><td></td></t<>		
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of which central248• Outputs248 of which central248Hardware configuration248Number of expansion units, max.3Number of DP masters3• integratednone• via CP4Number of operable FMs and CPs (recommended)8• FM8• CP, PtP8• CP, LAN6	-	248
• Outputs248- of which central248Hardware configuration248Number of expansion units, max.3Number of DP masters3• integratednone• via CP4Number of operable FMs and CPs (recommended)4• FM8• CP, PtP8• CP, LAN6		
of which central248Hardware configurationNumber of expansion units, max.3Number of DP masters3• integratednone• via CP4Number of operable FMs and CPs (recommended)8• FM8• CP, PtP8• CP, LAN6		
Hardware configuration         Number of expansion units, max.       3         Number of DP masters       3         • integrated       none         • via CP       4         Number of operable FMs and CPs (recommended)       4         • FM       8         • CP, PtP       8         • CP, LAN       6		
Number of expansion units, max.       3         Number of DP masters       integrated         • integrated       none         • via CP       4         Number of operable FMs and CPs (recommended)       6         • FM       8         • CP, PtP       8         • CP, LAN       6		
Number of DP masters         • integrated       none         • via CP       4         Number of operable FMs and CPs (recommended)         • FM       8         • CP, PtP       8         • CP, LAN       6		
• integratednone• via CP4Number of operable FMs and CPs (recommended)• FM8• CP, PtP8• CP, LAN6		3
• via CP     4       Number of operable FMs and CPs (recommended)     5       • FM     8       • CP, PtP     8       • CP, LAN     6		
Number of operable FMs and CPs (recommended)         • FM       8         • CP, PtP       8         • CP, LAN       6	-	
• FM         8           • CP, PtP         8           • CP, LAN         6		4
• CP, PtP 8 • CP, LAN 6		
• CP, LAN 6		
		8
Rack	• CP, LAN	6
	Rack	

Racks, max.	4
Modules per rack, max.	* 8: In rack 3 max. 7
Time of day	o, in fact 5 max. 7
Clock	Vee
Hardware clock (real-time)	Yes
retentive and synchronizable	Yes
Backup time	6 wk; At 40 °C ambient temperature
Deviation per day, max.	10 s; Typ.: 2 s
Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
<ul> <li>Behavior of the clock following expiry of backup period</li> </ul>	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
Number	1
<ul> <li>Range of values</li> </ul>	0 to 2^31 hours (when using SFC 101)
Granularity	1 h
retentive	Yes; Must be restarted at each restart
Clock synchronization	
supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	Yes
• in AS, slave	No
Digital inputs	
Number of digital inputs	16
<ul> <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
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	16
— up to 60 °C, max.	8
vertical installation	
— up to 40 °C, max.	8
Input voltage	
Rated value (DC)	24 V
<ul> <li>for signal "0"</li> </ul>	-3 to +5V
• for signal "1"	+15 to +30 V
Input current	
<ul> <li>for signal "1", typ.</li> </ul>	8 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— 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
for technological functions	
— at "0" to "1", max.	16 μs; Minimum pulse width/minimum pause between pulses at maximum counting frequency
Cable length	
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m; for technological functions: No
for technological functions	
— shielded, max.	100 m; at maximum count frequency
— unshielded, max.	not allowed
Digital outputs	
Number of digital outputs	16
<ul> <li>of which high-speed outputs</li> </ul>	4; Notice: You cannot connect the fast outputs of your CPU in parallel

integrated channels (DO)	16
Short-circuit protection	Yes; Clocked electronically
Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
Switching capacity of the outputs	165
• on lamp load, max.	5 W
	5 W
Load resistance range     olower limit	48 Ω
upper limit	4ο Ω 4 kΩ
Output voltage	4 612
	1 + ( 0 8 \)
for signal "1", min. Output current	L+ (-0.8 V)
•	500 mA
• for signal "1" rated value	5 mA
• for signal "1" permissible range, min.	
• 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
Parallel switching of two outputs	
• for uprating	No
for redundant control of a load	Yes
Switching frequency	400.11
with resistive load, max.	100 Hz
<ul> <li>with inductive load, max.</li> </ul>	0.5 Hz
<ul> <li>on lamp load, max.</li> </ul>	100 Hz
<ul> <li>of the pulse outputs, with resistive load, max.</li> </ul>	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> <li>shielded, max.</li> </ul>	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	0
integrated channels (AI)	0
Analog outputs	
Number of analog outputs	0
integrated channels (AO)	0
Encoder	
Connectable encoders	
2-wire sensor	Yes
— permissible quiescent current (2-wire sensor),	1.5 mA
max.	
Interfaces	
Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	1; MPI
Number of RS 422 interfaces	1; RS 422 / 485 combined
Point-to-point connection	
Cable length, max.	1 200 m
Integrated protocol driver	
— 3964 (R)	Yes
— ASCII	Yes
— RK 512	No
Transmission rate, RS 422/485	

— with 3964 (R) protocol, max.	19.2 kbit/s; 38.4 kbit/s half duplex; 19.2 kbit/s full duplex
— with ASCII protocol, max.	19.2 kbit/s; 38.4 kbit/s half duplex; 19.2 kbit/s full duplex
1. Interface	
	Integrated DC 495 interface
Interface type	Integrated RS 485 interface
Isolated	No
Interface types	200
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	
Transmission rate, max.	187.5 kbit/s
Services	
— PG/OP communication	Yes
— Routing	No
<ul> <li>Global data communication</li> </ul>	Yes
<ul> <li>— S7 basic communication</li> </ul>	Yes
— S7 communication	Yes; Only server, configured on one side
<ul> <li>— S7 communication, as client</li> </ul>	No; but via CP and loadable FB
- S7 communication, as server	Yes
2. Interface	
Interface type	Integrated RS 422/ 485 interface
Isolated	Yes
Interface types	
• RS 485	Yes; RS 422 / 485 (X.27)
<ul> <li>Output current of the interface, max.</li> </ul>	No
Protocols	
• MPI	No
PROFINET IO Controller	No
PROFINET IO Device	No
PROFINET CBA	No
PROFIBUS DP master	No
PROFIBUS DP slave	No
Point-to-point connection	
<ul> <li>Transmission rate, max.</li> </ul>	19.2 kbit/s; 38.4 kbit/s half duplex; 19.2 kbit/s full duplex
<ul> <li>Interface controllable from the user program</li> </ul>	Yes
<ul> <li>Interface can trigger alarm/interrupt in the user</li> </ul>	Yes; Message on break - identification
program	· · · · · · · · · · · · · · · · · · ·
Communication functions	
PG/OP communication	Yes
Data record routing	No
Global data communication	
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
<ul> <li>Size of GD packets, max.</li> </ul>	22 byte
<ul> <li>Size of GD packet (of which consistent), max.</li> </ul>	22 byte
S7 basic communication	
supported	Yes; Server
<ul> <li>User data per job, max.</li> </ul>	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 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.         240 byte; as server           S5 compatible communication         supported           • supported         Yes; via CP and loadable FC	
User data per job (of which consistent), max. 240 byte; as server     S5 compatible communication	
S5 compatible communication	
Number of connections	
• overall 8	
usable for PG communication	
— reserved for PG communication 1	
— adjustable for PG communication, min. 1	
— adjustable for PG communication, max. 7	
usable for OP communication	
— reserved for OP communication 1	
— adjustable for OP communication, min. 1	
— adjustable for OP communication, max. 7	
usable for S7 basic communication	
— reserved for S7 basic communication 0	
— adjustable for S7 basic communication, min. 0	
— adjustable for S7 basic communication, max. 4	
S7 message functions	
Number of login stations for message functions, max. 8; Depending on the configured con	onnections for PG/OP and S7 basic
communication	
Process diagnostic messages Yes	
simultaneously active Alarm-S blocks, max. 300	
Test commissioning functions	
Status block Yes; Up to 2 simultaneously	
Single step Yes	
Number of breakpoints 4	
Status/control	
Status/control variable Yes	
Variables     Inputs, outputs, memory bits, DB, t	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.	
Diagnostic buffer	
• present Yes	
Number of entries, max.	
— adjustable No	
— of which powerfail-proof 100; Only the last 100 entries are n	retained
Number of entries readable in RUN, max.	
- 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 input (green)     Yes	
Status indicator digital output (green)     Yes	
Integrated Functions	
Frequency measurement Yes	
Number of frequency meters     3; up to 30 kHz (see "Technological")	al Functions" manual)
controlled positioning No	
integrated function blocks (closed-loop control) Yes; PID controller (see "Technolog	gical 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
Potential separation	
Potential separation digital inputs	
<ul> <li>Potential separation digital inputs</li> </ul>	Yes
<ul> <li>between the channels</li> </ul>	No
<ul> <li>between the channels and backplane bus</li> </ul>	Yes
Potential separation digital outputs	
<ul> <li>Potential separation digital outputs</li> </ul>	Yes
<ul> <li>between the channels</li> </ul>	Yes
<ul> <li>between the channels, in groups of</li> </ul>	8
between the channels and backplane bus	Yes
Isolation	
Isolation tested with	600 V DC
Ambient conditions	
Ambient temperature during operation <ul> <li>min.</li> </ul>	0 °C
• max.	00 °C
Configuration	
Configuration software	
• STEP 7	Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
STEP 7 Lite	No
Programming	
Command set	see instruction list
<ul> <li>Nesting levels</li> </ul>	8
<ul> <li>System functions (SFC)</li> </ul>	see instruction list
<ul> <li>System function blocks (SFB)</li> </ul>	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
<ul> <li>User program protection/password protection</li> </ul>	Yes
<ul> <li>Block encryption</li> </ul>	Yes; With S7 block Privacy
Dimensions	
Width	80 mm
Height	125 mm
Depth	130 mm
Weights	
Weights Weight, approx.	500 g
troight, applox.	500 g
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