SIEMENS

Data sheet

6ES7312-5BD00-0AB0

SIMATIC S7-300, CPU 312C COMPACT CPU WITH MPI, 10 DI/6 DO, 2 FAST COUNTERS (10 KHZ), INTEGRATED 24V DC POWER SUPPLY, 16 KBYTE WORKING MEMORY, MICRO MEMORY CARD REQUIRED

Supply voltage			
Rated value (DC)	24 V		
permissible range, lower limit (DC)	20.4 V		
permissible range, upper limit (DC)	28.8 V		
Load voltage L+			
Rated value (DC)	24 V		
permissible range, lower limit (DC)	20.4 V		
• permissible range, upper limit (DC)	28.8 V		
Input current			
Current consumption (rated value)	500 mA		
Inrush current, typ.	11 A		
Power loss	Power loss		
Power loss, typ.	6 W; incl. integrated inputs/outputs		
Memory			
Work memory			
• integrated	16 kbyte; For program and data		
• expandable	No		
Load memory			
expandable FEPROM	Yes; with Micro Memory Card (MMC)		
• expandable FEPROM, max.	4 Mbyte		
Backup			
• present	Yes; Guaranteed by MMC (maintenance-free)		
• without battery	Yes; Program and data		
CPU processing times	CPU processing times		
for bit operations, typ.	0.2 µs		
for bit operations, max.	0.4 μs		
for word operations, typ.	1 μs		
for fixed point arithmetic, typ.	2 µs		
for floating point arithmetic, typ.	30 μs		
CPU-blocks			
DB			
Number, max.	63; DB 0 reserved		

FB	
Number, max.	64
FC	
Number, max.	64
OB	
• Size, max.	16 kbyte
 Number of time alarm OBs 	1
 Number of delay alarm OBs 	1
 Number of cyclic interrupt OBs 	1
 Number of process alarm OBs 	1
Nesting depth	
per priority class	8
 additional within an error OB 	4
Counters, timers and their retentivity	
S7 counter	
Number	128
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	128
Counting range	
— lower limit	1
— upper limit	999
S7 times	
Number	128
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	128
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
Data areas and their retentivity	
Flag	128 byte
Number, max. Retentivity available.	Yes; MB 0 to MB 127
Retentivity available	MB 0 to MB 15
Retentivity preset	O TO INI D 13

Inputs	Address area	
• Outputs 128 byte Process image • Inputs		
Process image Inputs	• Inputs	1 kbyte
• Inputs 128 byte • Outputs 128 byte Digital channels • Inputs 256 • Outputs 256 • Outputs 256 Analog channels • Inputs 64 • Outputs 32 Hardware configuration Number of expansion units, max. 0 Number of Pmasters 1 • Via CP 1 Number of operable FMs and CPs (recommended) • FM 4 • CP, PtP 2 • CP, LAN 1 Rack • Racks, max. 1 • Modules per rack, max. 1 • Modules per rack, max. 8 Time of day Clock synchronizable No Operating hours counter • Number 1 Clock synchronization • supported Yes Digital inputs 10 Input voltage • Rated value (DC) 24 V • for signal "1" +15 to +30V Input current • for signal "1", typ. 8 mA	Outputs	1 kbyte
Outputs 128 byte	Process image	
Digital channels	● Inputs	128 byte
Inputs Outputs Outputs Analog channels Inputs Outputs Outputs Outputs Outputs Outputs Hardware configuration Number of expansion units, max. O Number of DP masters via CP Inmore of OP masters Outputs FM OP, PtP OP, LAN Inmore of OP, LAN Inmore of Ay Clock Software clock • Software clock • retentive and synchronizable No Operating hours counter • Number • Number Operating hours counter • Number • Supported Yes Digital inputs Number of signal "1" • Story and	Outputs	128 byte
• Outputs 256 Analog channels • Inputs 64 • Outputs 32 Hardware configuration Number of expansion units, max. 0 Number of DP masters • via CP 1 Number of operable FMs and CPs (recommended) • FM 4 • CP, PIP 2 • CP, LAN 1 Rack • Racks, max. 1 • Modules per rack, max. 8 * Modules per rack, max. 8 * Software clock Yes • retentive and synchronizable No Operating hours counter • Number Operating hours counter • Number Operating hours counter • Number of digital inputs 10 Input voltage • Rated value (DC) 44 V • for signal "1" typ. 8 mA	Digital channels	
Analog channels • Inputs • Outputs 84 • Outputs Analog channels • Inputs • Outputs Analog or Analog	• Inputs	256
• Inputs 64 • Outputs 32	Outputs	256
Number of expansion units, max. 0	Analog channels	
Hardware configuration Number of expansion units, max. • via CP Number of operable FMs and CPs (recommended) • FM • CP, PIP • CP, LAN Rack • Racks, max. • Modules per rack, max. • Nodules per rack, max. • Software clock • retentive and synchronizable Operating hours counter • Number Clocks vertender of day Clocks vertender of day Clocks vertender of day Pyes • Racks ynchronizable No Operating hours counter • Number • Number 1 Clock vertender of day Clock vertender of day Clock of or signal "1" • Fated value (DC) • for signal "1" • for signal "1" • for signal "1" • for signal "1", typ. 8 mA	• Inputs	64
Number of expansion units, max. 0 Number of DP masters 1 • via CP 1 Number of operable FMs and CPs (recommended) 4 • FM 4 • CP, PtP 2 • CP, LAN 1 Rack 8 • Racks, max. 1 • Modules per rack, max. 8 Time of day Clock • Software clock Yes • retentive and synchronizable No Operating hours counter 1 • Number 1 Clock synchronization Yes • supported Yes Digital inputs Number of digital inputs 10 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	Outputs	32
Number of expansion units, max. 0 Number of DP masters 1 • via CP 1 Number of operable FMs and CPs (recommended) 4 • FM 4 • CP, PtP 2 • CP, LAN 1 Rack 8 • Racks, max. 1 • Modules per rack, max. 8 Time of day Clock • Software clock Yes • retentive and synchronizable No Operating hours counter 1 • Number 1 Clock synchronization Yes • supported Yes Digital inputs Number of digital inputs 10 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	Hardware configuration	
• via CP 1 Number of operable FMs and CPs (recommended) 4 • FM 4 • CP, PtP 2 • CP, LAN 1 Rack • Racks, max. 1 • Modules per rack, max. 8 Time of day Clock • Software clock Yes • retentive and synchronizable No Operating hours counter • Number 1 Clock synchronization Yes • supported Yes Digital inputs 10 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		0
Number of operable FMs and CPs (recommended) • FM • CP, PtP • CP, LAN 1 Rack • Racks, max. • Modules per rack, max. • Modules per rack, max. * Software clock • retentive and synchronizable • Number • Number • Number • Number • Supported * Yes * Supported * Supported * Yes * Supported	Number of DP masters	
	• via CP	1
• CP, PtP • CP, LAN 1 Rack • Racks, max. • Modules per rack, max. 1 • Modules per rack, max. 1 • Modules per rack, max. 1 • Modules per rack, max. Time of day Clock • Software clock • Software clock • retentive and synchronizable No Operating hours counter • Number • Number 1 Clock synchronization • supported Yes Digital inputs Number of digital inputs Number of digital inputs Number of digital inputs 10 Input voltage • Rated value (DC) • for signal "0" • 3 to +5V • for signal "1" Input current • for signal "1", typ. 8 mA	Number of operable FMs and CPs (recommended)	
• CP, LAN Rack • Racks, max. • Modules per rack, max. • Modules per rack, max. 1 • Modules per rack, max. 8 Time of day Clock • Software clock • retentive and synchronizable No Operating hours counter • Number • Number 1 Clock synchronization • supported Yes Digital inputs Number of digital inputs 10 Input voltage • Rated value (DC) • for signal "0" • 3 to +5V • for signal "1" Input current • for signal "1", typ. 8 mA	• FM	4
Rack Packs, max. Racks, max. Modules per rack, max. Modules per rack, max. Ime of day Clock Software clock Pes Pretentive and synchronizable No Operating hours counter Number Number Ves Clock synchronization Supported Yes Digital inputs Number of digital inputs Number of digital inputs Number of signal inputs Packet value (DC) For signal "0" Software clock Yes And And And And And And And And And An	• CP, PtP	2
Racks, max. Modules per rack, max. Modules per rack, max. No Clock Software clock retentive and synchronizable No Operating hours counter Number Number Ticlock synchronization supported Yes Digital inputs Number of digital inputs Number of digital inputs Number of of digital inputs Number of of digital inputs Number of digital inputs Num	● CP, LAN	1
Modules per rack, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. M	Rack	
Time of day Clock Software clock retentive and synchronizable No Operating hours counter Number Iclock synchronization supported Yes Digital inputs Number of digital inputs Input voltage Rated value (DC) for signal "0" for signal "1" for signal "1", typ. 8 mA	• Racks, max.	1
Clock Software clock retentive and synchronizable No Operating hours counter Number Number 1 Clock synchronization supported Yes Digital inputs Number of digital inputs Input voltage Rated value (DC) for signal "0" for signal "1" Input current for signal "1", typ. 8 mA	Modules per rack, max.	8
Clock Software clock retentive and synchronizable No Operating hours counter Number Number 1 Clock synchronization supported Yes Digital inputs Number of digital inputs Input voltage Rated value (DC) for signal "0" for signal "1" Input current for signal "1", typ. 8 mA	Time of day	
 retentive and synchronizable Operating hours counter Number Number Clock synchronization supported Yes Digital inputs Number of digital inputs Input voltage Rated value (DC) for signal "0" for signal "1" to +5V for signal "1" to +30V Input current for signal "1", typ. 8 mA 		
Operating hours counter • Number 1 Clock synchronization • supported Yes Digital inputs Number of digital inputs 10 Input voltage • Rated value (DC) • for signal "0" • for signal "1" • for signal "1" Input current • for signal "1", typ. 8 mA	Software clock	Yes
 Number Clock synchronization supported Yes Digital inputs Number of digital inputs 10 Input voltage Rated value (DC) for signal "0" for signal "1" +15 to +30V Input current for signal "1", typ. 8 mA 	 retentive and synchronizable 	No
Clock synchronization • supported Yes Digital inputs Number of digital inputs Input voltage • Rated value (DC) • for signal "0" • for signal "1" Input current • for signal "1", typ. 8 mA	Operating hours counter	
● supported Pigital inputs Number of digital inputs Input voltage ● Rated value (DC) ● for signal "0" ● for signal "1" Input current ● for signal "1", typ. Pyes 10 24 V -3 to +5V +15 to +30V Input current ● for signal "1", typ. 8 mA	Number	1
Digital inputs Number of digital inputs 10 Input voltage Rated value (DC) for signal "0" for signal "1" for signal "1" for signal "1", typ. 8 mA	Clock synchronization	
Number of digital inputs Input voltage Rated value (DC) for signal "0" for signal "1" for signal "1" for signal "1", typ. 8 mA	• supported	Yes
Input voltage	Digital inputs	
 Rated value (DC) for signal "0" for signal "1" for signal "1" for signal "1", typ. 8 mA 	Number of digital inputs	10
• for signal "0" -3 to +5V • for signal "1" +15 to +30V Input current • for signal "1", typ. 8 mA	Input voltage	
• for signal "1" +15 to +30V Input current • for signal "1", typ. 8 mA	Rated value (DC)	24 V
Input current • for signal "1", typ. 8 mA	• for signal "0"	-3 to +5V
• for signal "1", typ. 8 mA	• for signal "1"	+15 to +30V
	Input current	
Input delay (for rated value of input voltage)	• for signal "1", typ.	8 mA
	Input delay (for rated value of input voltage)	

for standard inputs	
— parameterizable	Yes
— at "0" to "1", max.	100 μs; 0.1 / 0.3 / 3 / 15 ms
for counter/technological functions	
— at "0" to "1", max.	50 µs
Cable length	
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m
Digital outputs	
Number of digital outputs	6
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 for 0 to 60 °C,	500 mA
max.	
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.	3 000 mA
— up to 60 °C, max.	1 500 mA
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
permissible quiescent current (2-wire)	1.5 mA
sensor), max.	
Interfaces	
MPI	
Cable length, max.	50 m; without repeater
_	,
1. Interface	
Functionality	V
• MPI	Yes
PROFIBUS DP master	No

 PROFIBUS DP slave 	No
 Point-to-point connection 	No
MPI	
Number of connections	6
 Transmission rate, max. 	187.5 kbit/s
Services	
— PG/OP communication	Yes
 Global data communication 	Yes
 S7 basic communication 	Yes
— S7 communication	Yes
 S7 communication, as client 	No
 S7 communication, as server 	Yes
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
 Number of GD packets, transmitter, max. 	4
 Number of GD packets, receiver, max. 	4
 Size of GD packets, max. 	22 byte
S7 basic communication	
• supported	Yes
 User data per job, max. 	76 byte
S7 communication	
• supported	Yes
• as server	Yes
• as client	No
 User data per job, max. 	64 kbyte
Number of connections	
• overall	6
usable for PG communication	
 reserved for PG communication 	1
 adjustable for PG communication, max. 	5
 usable for OP communication 	
 reserved for OP communication 	1
 adjustable for OP communication, max. 	5
 usable for S7 basic communication 	
 reserved for S7 basic communication 	2
 adjustable for S7 basic communication, 	2
max.	
S7 message functions	
Number of login stations for message functions, max.	3

Interveted Eurotions	
Integrated Functions Number of counters	2
Counting frequency (counter) max.	10 kHz
Frequency measurement	Yes
Number of pulse outputs	2
Limit frequency (pulse)	2.5 kHz
Potential separation	
Potential separation digital inputs	
 Potential separation digital inputs 	Yes
 between the channels, in groups of 	10
• between the channels and backplane bus	Yes
Potential separation digital outputs	
Potential separation digital outputs	Yes
• between the channels, in groups of	6
• between the channels and backplane bus	Yes
Configuration	
Configuration software	
• STEP 7	Yes; V5.1 SP2
Programming	
Nesting levels	8
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	80 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	410 g
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