SIEMENS

Data sheet

6ES7313-5BG04-0AB0



SIMATIC S7-300, CPU 313C, Compact CPU with MPI, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 3 high-speed counters (30 kHz), Integr. power supply 24 V DC, work memory 128 KB, Front connector (2x 40-pole) and Micro Memory Card required

General information	
HW functional status	01
Firmware version	V3.3
Engineering with	
 Programming package 	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
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	Miniature circuit breaker, type C; min. 2 A; miniature circuit
(recommendation)	breaker type B, min. 4 A
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
• Repeat rate, min.	1 s
Load voltage L+	
Digital inputs	
— Rated value (DC)	24 V
- Reverse polarity protection	Yes

Digital outputs	
— Rated value (DC)	24 V
— Reverse polarity protection	No
Input current	
Current consumption (rated value)	650 mA
Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	5 A
l²t	0.7 A ² ·s
Digital inputs	
 from load voltage L+ (without load), max. 	80 mA
Digital outputs	
 from load voltage L+, max. 	50 mA
Power loss	
Power loss, typ.	12 W
Memory	
Work memory	
• integrated	128 kbyte
• expandable	No
 Size of retentive memory for retentive data blocks 	64 kbyte
Load memory	
• Plug-in (MMC)	Yes
 Plug-in (MMC), max. 	8 Mbyte
 Data management on MMC (after last programming), min. 	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.	0.15 µs
for fixed point arithmetic, typ.	0.2 µs
for floating point arithmetic, typ.	0.72 µs
	0.12 #0
CPU-blocks	
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

FC • Number, max. 1 024; Number range: 0 to 7999 • Size, max. 64 kbyte • Description see instruction list • Size, max. 64 kbyte • Number of free cycle OBs 1:0B 1 • Number of free cycle OBs 1:0B 10 • Number of free cycle OBs 1:0B 10 • Number of cycle interrupt OBs 4:0B 32, 33, 34, 35 • Number of sprocess alarm OBs 1:0B 100 • Number of synchronous error OBs 4:0B 40, 82, 85, 87 • Number of synchronous error OBs 1:0B 101 • Statut 16 • additional within an error OB 4 * Ounter 256 • Number 256 • Retentivity 256 • Lower limit 0 • Lower limit 0 • upper limit 0 • upper limit 0 • present Yes • Number Yes • Number	• Size, max.	64 kbyte
• Size, max.64 kbyleOB• OB• Cascingtionseinstruction list• Size, max.64 kbyle• Number of free cycle OBs1.0B 10• Number of free cycle OBs2.0B 20, 21• Number of day alarm OBs2.0B 20, 21• Number of cyclic interrupt OBs4.0B 32, 33, 34, 35• Number of synchronous error OBs4.0B 40• Number of synchronous error OBs4.0B 40, 82, 85, 87• Number of synchronous error OBs4.0B 12, 122• Number of synchronous error OBs10• Additional within an error OB10• Additional within an error OB10• Aumober of synchronous error OBs10• Additional within an error OB10• Aumober of synchronous error OBs10• Aumober of synchronous error OBs10• Additional within an error OB20• Counters, tuners and their retentivity10• Aumober10• Aumober25• Power limit0• Lower limit0• Lower limit0• Lower limit0• Upper limit0• Upper limit0• TypeSFB• NumberSFB• Number10• Aumober10• Aumober10• Aumober10• Aumober10• Aumober10• Aumober10• Aumober10• Aumober10• Aumober10• Aumober	FC	
OB• Descriptionsee instruction list• Size, max.64 kbyte• Number of free cycle OBs1; OB 1• Number of free cycle OBs1; OB 10• Number of time alarn OBs2; OB 20, 21• Number of cyclic interrupt OBs4; OB 32, 33, 34, 35• Number of startup OBs1; OB 10• Number of startup OBs1; OB 10• Number of startup OBs1; OB 100• Number of startup OBs2; OB 121, 122Number of synchronous error OBs2; OB 121, 122Number of synchronous error OBs16• additional within an error OB4• Vesting depth256• Number256• Number255• Number255• Number255• Initit255• Lower limit99• Lower limit99• upper limit99• presentYes• TypeSFB• NumberNumber• NumberSFB• NumberSFB• Number99• StrupeSFB• Number95• Number95• Number95• StrupeSFB• Number95• Number95• Number95• Number95• Lower limit0• upper limit95• upper limit95• upper limit95• upper limit95• upper limit95• upper limit95 <td>• Number, max.</td> <td>1 024; Number range: 0 to 7999</td>	• Number, max.	1 024; Number range: 0 to 7999
• Descriptionsee instruction list• Size, max.64 kbyte• Number of free cycle DBs1: 0B 1• Number of time alarn OBs1: 0B 10• Number of delay alarn OBs2: 0B 20, 21• Number of delay alarn OBs4: 0B 32, 33, 34, 35• Number of process alarn OBs1: 0B 40• Number of startup OBs1: 0B 40• Number of synchronous error OBs2: 0B 80, 82, 85, 87• Number of synchronous error OBs2: 0B 10, 22• Number of synchronous error OBs4: 0CH 02, 25, 87• Number of synchronous error OBs4: 0CH 02, 20, 21• Number of synchronous error OBs4: 0CH 02, 20, 21• Number of synchronous error OBs4: 0CH 02, 20, 21• Number of synchronous error OBs4: 0CH 02, 20, 21• Number of synchronous error OBs4: 0CH 02, 20, 21• Per priority class16• adjustable4• Ourder255• Number255• Lower limit0- upper limit255• upper limit99• Upper limit99• NumberSFB• NumberSFB• NumberSFB• Number255• Number255• Number356• Ecounting357• Intit0• Upper limit356• Upper limit356• Number456• Upper limit356• Number356• Upper limit356• Upper limit356 <t< td=""><td>• Size, max.</td><td>64 kbyte</td></t<>	• Size, max.	64 kbyte
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• Number of free cycle OBs1, OB 1• Number of time alarm OBs1, OB 10• Number of delay alarm OBs2, OB 20, 21• Number of cyclic interrupt OBs4, OB 32, 33, 34, 35• Number of startup OBs1, OB 10• Number of startup OBs1, OB 10• Number of asynchronous error OBs2, OB 20, 21• Number of asynchronous error OBs2, OB 121, 122• Number of asynchronous error OBs2, OB 121, 122• Number of asynchronous error OBs16• delitional within an error OB16• Courters.16• Number256• Number256• Number250 a 10 a 7• Ower limit0• opper limit250 a 10 a 7• ourger limit99• ourger limit99• presentSFE• NumberSFE• NumberSFE <trr>• Number<</trr>	Description	see instruction list
Number of time alarn OBs1: OB 10• Number of delay alarn OBs2: OB 20, 21• Number of cyclic interrupt OBs4: OB 32, 33, 34, 35• Number of synchronous error OBs1: OB 100• Number of synchronous error OBs2: OB 80, 82, 85, 87• Number of synchronous error OBs2: OB 121, 122Number of synchronous error OBs• Authber of synchronous error OBs2: OB 121, 122Number of synchronous error OBs• Authber of synchronous error OBs4CounterSoft counter• Synchronous error OBs266• Number256• Number255- olwer limit0- upper limit255- olwer limit0- upper limit999EECounter• PresentSFB• NumberSFB• Number266Retentivity10- adjustable999• Diver limit0- upper limit255• NumberSFB• NumberSFB• NumberSFB• Number266• Number266• Number10• TypeSFB• Number256• Number256• Number256• Outer limit0• outer limit256• outer limit0• outer limit256• outer limit0• outer limit0• outer limit <td< td=""><td>• Size, max.</td><td>64 kbyte</td></td<>	• Size, max.	64 kbyte
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• Number of cyclic interrupt OBs4; OB 32, 33, 34, 35• Number of sprocess alarm OBs1; OB 40• Number of synchronous error OBs4; OB 80, 82, 85, 87• Number of synchronous error OBs4; OB 80, 82, 85, 87• Number of synchronous error OBs8; OB 80, 82, 85, 87• Number of synchronous error OBs8; OB 80, 82, 85, 87• Per priority class16• additional within an error OB4• Counters, Inners and their retentivity57• Stroumer256• Number255• lower limit0• lower limit255• preset20 to 2 7• Counting range1• lower limit0• upper limit98• number95• preset57 E• Number95• number95• number95• number9• num	 Number of time alarm OBs 	1; OB 10
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• Number of startup OBs1; OB 100• Number of asynchronous error OBs4; OB 80, 82, 85, 87• Number of synchronous error OBs2; OB 121, 122Nesting depth16• additional within an error OB4• Counters, timers and their retentivity57S7 counter256• Number266Retentivity0- adjustableYes- lower limit0- upper limit255- preset2 0 to Z 7Counting range20 to Z 7EC counter999IEC counter10• Number999S7 timesYes• Number256ToypeSF B• Number999IEC counterVes• number256• number256- adjustable999IEC counter10• present999• NumberS7 times• number256• nupp Imit0 <t< td=""><td> Number of cyclic interrupt OBs </td><td>4; OB 32, 33, 34, 35</td></t<>	 Number of cyclic interrupt OBs 	4; OB 32, 33, 34, 35
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Number of synchronous error OBs2; OB 121, 122Nesting depth16• per priority class16• additional within an error OB4256S7 counter256• Number256Retentivity9- adjustableYes- lower limit0- upper limit255- preset2 to 2 7Counting range2- lower limit0- upper limit99IEC counter10* TypeSFBNumberSFBNumber256Retentivity256- adjustable99IEC counter99* TypeSFBNumberSFBNumber256Retentivity256- adjustableYes- adjustable256Number256Number256Number256Number256Number256Number256Number256Retentivity- adjustable- adjustableYes- lower limit0- lower limit0- lower limit255- lower limit255- lower limit0- lower limit0 <td>Number of startup OBs</td> <td>1; OB 100</td>	Number of startup OBs	1; OB 100
Nesting depth 16 • additional within an error OB 4 Counters, timers and their retentivity 57 S 7 counter 256 Retentivity - - adjustable Yes - lower limit 0 - upper limit 255 - preset Z 0 to Z 7 Counter 0 - upper limit 0 - upper limit 0 - upper limit S55 - preset Z 0 to Z 7 Counter 9 - lower limit 0 - upper limit SFE Number Ves - lower limit 0 - upper limit SFE Number Ves ST times Ves Number 256 Retentivity - - adjustable Yes - lower limit 0 - lower limit 0 - upper limit 255 - lower limit 0 <tr td=""></tr>	 Number of asynchronous error OBs 	4; OB 80, 82, 85, 87
• per priority class16• additional within an error OB4Counters, timers and their retentivity\$7 counter256• Number256Retentivity adjustableYes- lower limit0- upper limit255- preset2 0 to Z 7Counting range lower limit0- upper limit999IEC counterSFB• TypeSFB• NumberVes• NumberSFB• Number256• Number256• NumberYes• InstructYes• InstructYes• InstructYes• InstructYes• NumberYes• Number256• number0• number0• numper limit0• numper limit0• numper limit0• numper limit255• numper limit255• numper limit0• numper limit255• numper limit0• numper limit0• numper limit0• numper limit255• numper limit<	 Number of synchronous error OBs 	2; OB 121, 122
• additional within an error OB 4 counters. timers and their retentivity 57 counter • Number 256 Retentivity 7 - adjustable Yes - lower limit 0 - upper limit 255 - preset 2 0 to Z 7 Counter 999 EC counter 999 EC counter SFB • Type SFB • Number 256 • Number 257 • upper limit 0 - upper limit 0 - upper limit 0 - upper limit 0 • present Ves • Type SFB • Number 256 Retentivity - • Number 256 Retentivity - - adjustable Yes - lower limit 0 - lower limit 0 - upper limit 255 - lower limit 0 <td< td=""><td>Nesting depth</td><td></td></td<>	Nesting depth	
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- adjustableYes- lower limit0- upper limit255- preset2 to Z 7Counting range0- lower limit0- upper limit099IEC counterYes• presentYes• typeSFB• NumberUnlimited (limited only by RAM capacity)S7 times56Retentivity9- adjustableYes- adjustable255- lower limit0- nupper limit0 <td< td=""><td>Number</td><td>256</td></td<>	Number	256
lower limit0 upper limit255 presetZ 0 to Z 7Counting range0 lower limit0 upper limit999IEC counterI presentYes• presentSFB• NumberUnlimited only by RAM capacity)S7 times55I entrity95- adjustableYes- adjustable95- lower limit0- lower limit0- presetYes- nupper limit55- nupper limit0- nupper limit255- nupper limit255- presetNo retentivity	Retentivity	
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presetZ 0 to Z 7Counting range0lower limit099IEC counterYes• presentYes• TypeSFB• NumberUnlimited (limited only by RAM capacity)S7 timesYes• Number256• NumberYes• not presentYes• Number256• Number90• Diver limit0• not presentYes• not presentYes• Number256• Number0• not present0• not present• not present </td <td>— lower limit</td> <td>0</td>	— lower limit	0
Counting range 0 - lower limit 0 - upper limit 099 IEC counter Yes • Type SFB • Number Unlimited only by RAM capacity) S7 times 256 Retentivity Yes - adjustable Yes - lower limit 0 - lower limit 0 - nupper limit 55 - nupper limit Nor etentivity	— upper limit	255
- lower limit0- upper limit999IEC counter• presentYes• TypeSFB• NumberUnlimited (limited only by RAM capacity)S7 times256Retentivity1- adjustableYes- lower limit0- upper limit255- upper limit255- presetNo retentivity	— preset	Z 0 to Z 7
upper limit999IEC counter• presentYes• TypeSFB• NumberUnlimited (limited only by RAM capacity)S7 times• Number256Retentivity adjustableYes lower limit0 upper limit255 upper limit255 upper limit0 upper limit255No retentivity	Counting range	
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• presentYes• TypeSFB• NumberUnlimited only by RAM capacity)S7 times256• Number256Retentivity- adjustable- adjustableYes- lower limit0- upper limit255- presetNo retentivity	— upper limit	999
• TypeSFB• NumberUnlimited only by RAM capacity)57 times57 times• Number256Retentivity- adjustable- adjustableYes- lower limit0- upper limit255- presetNo retentivity	IEC counter	
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S7 times 256 Retentivity 7 - adjustable Yes - lower limit 0 - upper limit 255 - preset No retentivity	• Туре	SFB
• Number256RetentivityYes- adjustable9- lower limit0- upper limit255- presetNo retentivity	• Number	Unlimited (limited only by RAM capacity)
Retentivity Yes — adjustable Yes — lower limit 0 — upper limit 255 — preset No retentivity	S7 times	
adjustableYes lower limit0 upper limit255 presetNo retentivity	Number	256
— lower limit 0 — upper limit 255 — preset No retentivity	Retentivity	
— upper limit 255 — preset No retentivity	— adjustable	Yes
- preset No retentivity	— lower limit	0
	— upper limit	255
Time range	— 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, max. 64 KB
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	
 Retentivity adjustable 	Yes; via non-retain property on DB
 Retentivity preset 	Yes
Local data	
• per priority class, max.	32 kbyte; Max. 2048 bytes per block
Address area	
I/O address area	
Inputs	1 024 byte
Outputs	1 024 byte
of which distributed	
— Inputs	none
— Outputs	none
Process image	
• Inputs	1 024 byte
Outputs	1 024 byte
 Inputs, adjustable 	1 024 byte
 Outputs, adjustable 	1 024 byte
• Inputs, default	128 byte
• Outputs, default	128 byte
Default addresses of the integrated channels	
— Digital inputs	124.0 to 126.7
— Digital outputs	124.0 to 125.7
— Analog inputs	752 to 761
— Analog outputs	752 to 755
Digital channels	
Inputs	1 016
— of which central	1 016
Outputs	1 008
Calpaio	

— of which central	1 008
Analog channels	
Inputs	253
— of which central	253
Outputs	250
— of which central	250
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	none
• 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
ïme 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; Typ.: 2 s
 Behavior of the clock following POWER-ON 	Clock continues running after POWER OFF
 Behavior of the clock following expiry of backup period 	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
• Number	1
Number/Number range	0
Range of values	0 to 2^31 hours (when using SFC 101)
Granularity	1h
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	24

 of which inputs usable for technological functions 	12
integrated channels (DI)	24
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	24
— up to 60 °C, max.	12
vertical installation	
— up to 40 °C, max.	12
Input voltage	
Rated value (DC)	24 V
● for signal "0"	-3 to +5V
● for signal "1"	+15 to +30 V
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 (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
 of which high-speed outputs 	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	

5 W
48 Ω
4 kΩ
L+ (-0.8 V)
500 mA
5 mA
0.6 A
5 mA
0.5 mA
No
Yes
100 Hz
0.5 Hz
100 Hz
2.5 kHz
3 A
2 A
2 A
1 000 m
600 m
4
4
1
5; 4x current/voltage, 1x resistance
5 V; Permanent
30 V; Permanent
0.5 mA; Permanent

permissible input current for current input (destruction limit), max.	50 mA; Permanent
No-load voltage for resistance-type transmitter, typ.	3.3 V
Constant measurement current for resistance-type transmitter, typ.	1.25 mA
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
Voltage	Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ
• Current	Yes; ±20 mA / 100 $\Omega;$ 0 mA to 20 mA / 100 $\Omega;$ 4 mA to 20 mA / 100 Ω
Resistance thermometer	Yes; Pt 100 / 10 MΩ
Resistance	Yes; 0 Ω to 600 Ω / 10 $M\Omega$
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	100 Ω
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	100 Ω
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	100 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
— Input resistance (Pt 100)	10 MΩ
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	10 MΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	No
Characteristic linearization	
parameterizable	Yes; by software
— for resistance thermometer	Pt 100
Cable length	
 shielded, max. 	100 m
Analog outputs	
Number of analog outputs	2
integrated channels (AO)	2
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	55 mA

Current output, no-load voltage, max.	14 V
Output ranges, voltage	
• 0 to 10 V	Yes
● -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
 for voltage output two-wire connection 	Yes; Without compensation of the line resistances
 for voltage output four-wire connection 	No
 for current output two-wire connection 	Yes
Load impedance (in rated range of output)	
 with voltage outputs, min. 	1 kΩ
• with voltage outputs, capacitive load, max.	0.1 µF
 with current outputs, max. 	300 Ω
 with current outputs, inductive load, max. 	0.1 mH
Destruction limits against externally applied voltages an	id currents
 Voltages at the outputs towards MANA 	16 V; Permanent
• Current, max.	50 mA; Permanent
Cable length	
● shielded, max.	200 m
Analog value generation for the inputs Measurement principle	Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel	Actual value encryption (successive approximation)
Resolution with overrange (bit including sign),	12 bit
max.	12.51
 Integration time, parameterizable 	Yes; 16.6 / 20 ms
 Interference voltage suppression for 	50 / 60 Hz
interference frequency f1 in Hz	
 permissible input frequency, max. 	400 Hz
• Time constant of the input filter	0.38 ms
 Basic execution time of the module (all 	1 ms
channels released)	
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), 	12 bit
max.	
 Conversion time (per channel) 	1 ms
Settling time	
• for resistive load	0.6 ms
 for capacitive load 	1 ms

• for inductive load

0.5 ms

Encoder	
Connection of signal encoders	
 for voltage measurement 	Yes
 for current measurement as 2-wire transducer 	Yes; with external supply
 for current measurement as 4-wire transducer 	Yes
 for resistance measurement with two-wire connection 	Yes; Without compensation of the line resistances
 for resistance measurement with three-wire connection 	No
 for resistance measurement with four-wire connection 	No
Connectable encoders	
• 2-wire sensor	Yes
 permissible quiescent current (2-wire sensor), max. 	1.5 mA
Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to	0.06 %
input range), (+/-)	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.1 %
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.06 %
Operational error limit in overall temperature range	
 Voltage, relative to input range, (+/-) 	1 %
 Current, relative to input range, (+/-) 	1 %
• Resistance, relative to input range, (+/-)	1 %
 Voltage, relative to output range, (+/-) 	1 %
• Current, relative to output range, (+/-)	1 %
Basic error limit (operational limit at 25 °C)	
 Voltage, relative to input range, (+/-) 	0.8 %; Linearity error ±0.06 %
• Current, relative to input range, (+/-)	0.8 %; Linearity error ±0.06 %
• Resistance, relative to input range, (+/-)	0.8 %; Linearity error ±0.2 %
 Resistance thermometer, relative to input range, (+/-) 	0.8 %
 Voltage, relative to output range, (+/-) 	0.8 %
• Current, relative to output range, (+/-)	0.8 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	

• Series mode interference (peak value of interference) min	30 dB
interference < rated value of input range), min.Common mode interference, min.	40 dB
Interfaces Number of industrial Ethernet interfaces	0
Number of PROFINET interfaces	0
Number of RS 485 interfaces	 1; MPI
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	No
Power supply to interface (15 to 30 V DC), max.	200 mA
Interface types	
• RS 485	Yes
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
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes; Only server, configured on one side
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes
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
• Size of GD packets, max.	22 byte
 Size of GD packet (of which consistent), max. 	22 byte
S7 basic communication	

	Vec
• 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)
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. 	240 byte; as server
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	0
— adjustable for S7 basic communication,	0
min.	
— adjustable for S7 basic communication,	4
max.	
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.	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, 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
Diagnostic buffer	
• present	Yes
 Number of entries, max. 	500
— adjustable	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
-	10
— preset Service data	
	Yes
• can be read out	163
Interrupts/diagnostics/status information	
Diagnostics indication LED	
 Status indicator digital input (green) 	Yes
 Status indicator digital output (green) 	Yes
Integrated Functions	
Number of counters	3; See "Technological Functions" manual
Counting 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
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
Potential separation analog inputs	

• Potential separation analog inputs Yes; common for analog I/O • between the channels No • between the channels and backplane bus Yes • Potential separation analog outputs Yes; common for analog I/O • between the channels No • between the channels No • between the channels and backplane bus Yes; Isolation Second Common for analog I/O • between the channels and backplane bus Yes; Isolation Second Common for analog I/O • between the channels and backplane bus Yes; Isolation Second Common for analog I/O Ambient conditions Ambient conditions Ambient temperature during operation • min. 0 °C 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 • System functions (SFC) see instruction list • System functions (SFC) see instruction list • System function block (SFB) Yes - FBD Yes - FBD Yes - SCL Yes		Vacuation for analog 1/0
Letteres the channels and backplane bus Yes Potential separation analog outputs Yes; common for analog I/O Potential separation analog outputs Yes; common for analog I/O between the channels No between the channels and backplane bus Yes; isolation tested with 600 V DC Ambient conditions 70 ° C Ambient conditions 0 ° C min. 0 ° C 60 ° C Configuration 0 ° C stEP 7 Ves; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203 stEP 7 Lite No Programming see instruction list stEP 7 Lite No Programming language See instruction list system function blocks (SFB) see instruction list system function blocks (SFB) <td></td> <td></td>		
Potential separation analog outputs Yes; common for analog I/O • Potential separation analog outputs Yes; common for analog I/O • between the channels No • between the channels and backplane bus Yes Isolation 600 V DC Ambient conditions Ambient temperature during operation • min. 0 °C • max. 60 °C Configuration 60 °C Configuration software Ves; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203 • STEP 7 Lite No Programming see instruction list • System functions (SFC) see instruction list • System function blocks (SFB) see instruction list • System function blocks (SFB) see instruction list • System function blocks (SFB) Yes - FBD Yes - STL Yes - SCL Yes - GRAPH Yes - HiGraph@ Yes		
Potential separation analog outputs Yes; common for analog I/O between the channels No between the channels and backplane bus Yes Isolation Solation tested with 600 V DC Ambient temperature during operation 0 °C 60 °C min. 0 °C 60 °C Configuration fmax. 60 °C Configuration software Ves; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203 No STEP 7 Lite No Programming See instruction list System functions (SFC) see instruction list See instruction list System function blocks (SFB) see instruction list System function blocks (SFB) See instruction list System function blocks (SFB) See System function blocks (SFB) Yes	· · · · · · · · · · · · · · · · · · ·	Yes
• between the channels and backplane busNo• between the channels and backplane busYesIsolation600 V DCAmbient temperature during operation0 °C• min.0 °C• max.60 °CConfiguration software60 °C• STEP 7Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203• STEP 7 LiteNoProgrammingsee instruction list• Command setsee instruction list• Nesting levels8• System function blocks (SFB)see instruction list• STEP 7Yes- LADYes- FBDYes- STLYes- SCLYes- SCLYes- GRAPHYes- HiGraph@Yes- HiGraph@Yes- HiGraph@Yes	Potential separation analog outputs	
• between the channels and backplane bus Yes Isolation 600 V DC Ambient conditions 600 V DC Ambient temperature during operation 0 °C • min. 0 °C • max. 60 °C Configuration 60 °C Configuration software Ves; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203 • 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 see instruction list • Command set see instruction list • System functions (SFC) see instruction list • System function blocks (SFB) see instruction list • Size (SCL Yes - SCL Yes - SCL Yes - GRAPH	 Potential separation analog outputs 	Yes; common for analog I/O
Isolation Isolation tested with 600 V DC Ambient temperature during operation • min. • min. 0 °C • max. 60 °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 see instruction list • Nesting levels 8 • System function blocks (SFC) see instruction list • System function blocks (SFB) see instruction list Programming language - - LAD Yes - FBD Yes - SCL Yes - SCL Yes - GRAPH Yes - HiGraph® Yes	 between the channels 	No
Isolation tested with 600 V DC Ambient conditions Ambient temperature during operation • min. 0 °C • max. 60 °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 See instruction list • Command set see instruction list • Nesting levels 8 • System functions (SFC) see instruction list • System function blocks (SFB) see instruction list Programming language - LAD - LAD Yes - FBD Yes - STL Yes - SCL Yes - CFC Yes - GRAPH Yes - HiGraph® Yes	 between the channels and backplane bus 	Yes
Ambient conditions Ambient temperature during operation • min. 0 °C • max. 60 °C Configuration software 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 • System functions (SFC) see instruction list • System function blocks (SFB) see instruction list Programming language – - LAD Yes - FBD Yes - SCL Yes - SCL Yes - CFC Yes - GRAPH Yes - HiGraph® Yes - HiGraph® Yes	Isolation	
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• STEP 7Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203• STEP 7 LiteNoProgrammingSee instruction list• Command setsee instruction list• Nesting levels8• System functions (SFC)see instruction list• System function blocks (SFB)see instruction list• System function blocks (SFB)see instruction list• Programming languageYes- LADYes- FBDYes- STLYes- SCLYes- CFCYes- GRAPHYes- HiGraph®Yes- HiGraph®Yes	Configuration	
higher with HSP 203• STEP 7 LiteNoProgrammingsee instruction list• Command setsee instruction list• Nesting levels8• System functions (SFC)see instruction list• System function blocks (SFB)see instruction list• System function blocks (SFB)see instruction list• Programming languageYes- LADYes- FBDYes- STLYes- SCLYes- CFCYes- GRAPHYes- HiGraph®Yes- HiGraph®Yes	Configuration software	
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 - CFC Yes - CFC Yes - GRAPH Yes - HiGraph® Yes	• STEP 7	
• Command setsee instruction list• Nesting levels8• System functions (SFC)see instruction list• System function blocks (SFB)see instruction list• Programming language- LADYes- FBDYes- STLYes- SCLYes- CFCYes- GRAPHYes- HiGraph®YesKnow-how protectionYes	STEP 7 Lite	No
• 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 - CFC Yes - GRAPH Yes - HiGraph® Yes	Programming	
 System functions (SFC) System function blocks (SFB) see instruction list System function blocks (SFB) ee instruction list Programming language - LAD - FBD - FBD Yes - STL SCL SCL - SCL Yes - CFC Yes - GRAPH HiGraph® Know-how protection 	Command set	see instruction list
• System functions (SFC)see instruction list• System function blocks (SFB)see instruction listProgramming language- LADYes- FBDYes- STLYes- SCLYes- CFCYes- GRAPHYes- HiGraph®YesKnow-how protectionYes	Nesting levels	8
• System function blocks (SFB) see instruction list Programming language - LAD Yes - FBD Yes - STL Yes - SCL Yes - CFC Yes - GRAPH Yes - HiGraph® Yes		see instruction list
Programming language - LAD Yes - FBD Yes - STL Yes - SCL Yes - CFC Yes - GRAPH Yes - HiGraph® Yes		see instruction list
FBD Yes STL Yes SCL Yes CFC Yes GRAPH Yes HiGraph® Yes		
- STLYes- SCLYes- CFCYes- GRAPHYes- HiGraph®YesKnow-how protectionYes		Yes
- SCL Yes - CFC Yes - GRAPH Yes - HiGraph® Yes	— FBD	Yes
- SCLYes- CFCYes- GRAPHYes- HiGraph®YesKnow-how protectionYes	— STL	Yes
- CFC Yes - GRAPH Yes - HiGraph® Yes		Yes
GRAPH Yes HiGraph® Yes Know-how protection Yes		Yes
— HiGraph® Yes Know-how protection Yes		
Know-how protection		
	·	Yes
Block encryption Yes; With S7 block Privacy		
Dimensions Width 120 mm		120 mm
Height 125 mm Depth 130 mm		
Weights		
Weight, approx. 660 g		

last modified: