6ES7312-5BF04-0AB0

Data sheet



SIMATIC S7-300, CPU 312C Compact CPU with MPI, 10 DI/6 DQ, 2 high-speed counters (10 kHz) Integr. power supply 24 V DC, work memory 64 KB, Front connector (1x 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 (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit 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 outputs	
— Rated value (DC)	24 V
 Reverse polarity protection 	No
Input current	
Current consumption (rated value)	570 mA
Current consumption (in no-load operation), typ.	90 mA
Inrush current, typ.	5 A
I²t	0.7 A ² ·s
Digital outputs	
from load voltage L+, max.	25 mA
Power loss	
Power loss, typ.	8 W
Memory	
Work memory	
• integrated	64 kbyte
expandable	No
Load memory	
• Plug-in (MMC)	Yes
Plug-in (MMC), max.	8 Mbyte
 Data management on MMC (after last programming), min. 	10 a
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CPU processing times	

for bit operations, typ.	0.1 μs
for word operations, typ.	0.24 µs
for fixed point arithmetic, typ.	0.32 μs
for floating point arithmetic, typ.	1.1 μs
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
• 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
Number of delay alarm OBs	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	
per priority class	16
additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
• Number	256
Retentivity	
— adjustable	Yes
— 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)
S7 times	
 Number 	
	256
Retentivity	
Retentivity — adjustable	Yes
Retentivity — adjustable — preset	
Retentivity — adjustable — preset Time range	Yes No retentivity
Retentivity — adjustable — preset Time range — lower limit	Yes No retentivity 10 ms
Retentivity — adjustable — preset Time range — lower limit — upper limit	Yes No retentivity
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer	Yes No retentivity 10 ms 9 990 s
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present	Yes No retentivity 10 ms 9 990 s Yes
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type	Yes No retentivity 10 ms 9 990 s Yes SFB
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type • Number	Yes No retentivity 10 ms 9 990 s Yes
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type • Number Data areas and their retentivity	Yes No retentivity 10 ms 9 990 s Yes SFB Unlimited (limited only by RAM capacity)
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type • Number Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max.	Yes No retentivity 10 ms 9 990 s Yes SFB
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type • Number Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag	Yes No retentivity 10 ms 9 990 s Yes SFB Unlimited (limited only by RAM capacity)
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type • Number Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Size, max.	Yes No retentivity 10 ms 9 990 s Yes SFB Unlimited (limited only by RAM capacity) 64 kbyte 256 byte
Retentivity — adjustable — preset Time range — lower limit — upper limit IEC timer • present • Type • Number Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag	Yes No retentivity 10 ms 9 990 s Yes SFB Unlimited (limited only by RAM capacity)

Number of clock memories	8: 1 memory byte
Number of clock memories Data blocks	8; 1 memory byte
Retentivity adjustable	Yes; via non-retain property on DB
	Yes
Retentivity preset Local data	165
per priority class, max.	32 kbyte; Max. 2048 bytes per block
Address area	32 kbyte, wax. 2040 bytes per block
I/O address area	
• Inputs	1 024 byte
Outputs	1 024 byte
of which distributed	1 024 0910
— 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 125.1
— Digital outputs	124.0 to 124.5
Digital channels	
• Inputs	266
— of which central	266
 Outputs 	262
— of which central	262
Analog channels	
• Inputs	64
— of which central	64
Outputs	64
— of which central	64
Hardware configuration	
Number of expansion units, max.	0
Number of DP masters	
integrated	none
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	4
Rack	4
Racks, max. Madula paragala may	1
Modules per rack, max. Time of day.	8
Time of day	
Clock • Software clock	Von
	Yes No: Ruffered: No. Can be synchronized: Ves
retentive and synchronizable Deviation per day, may	No; Buffered: No, Can be synchronized: Yes
Deviation per day, max.Behavior of the clock following POWER-ON	10 s; Typ.: 2 s the clock continues at the time of day it had when power was switched off
Benavior of the clock following POWER-ON Operating hours counter	and Glock Continues at the time of day it had when power was switched off
Number	1
Number/Number range	0
Range of values	0 to 2^31 hours (when using SFC 101)
Granularity	1 h
• retentive	Yes; Must be restarted at each restart
Clock synchronization	100, made po restanted at each restant
• supported	Yes
• to MPI, master	Yes
·- ··· ·, ··· ·	

# In AS, insister Yes No No No No No No No N	• on MPI, device	Yes
### No. Committee of digital inputs		
Number of digital inputs of which inputs usable for technological functions Integrated channels (DI) Input characteristic curve in accordance with IEC 61131, type 1 Number of simultaneously controllable inputs Input characteristic curve in accordance with IEC 61131, type 1 Number of simultaneously controllable inputs Incorporation installation — up to 40 °C, max. — service installation — up to 40 °C, max. — service installation — up to 40 °C, max. — service installation — up to 40 °C, max. — service installation — up to 40 °C, max. — service installation — up to 40 °C, max. — service installation — parameterizable — parameterizable — parameterizable — parameterizable — parameterizable — parameterizable — service installation — service instal		
Number of digital injusts of which injust usable for technological functions integrated channels (D) Injust (D) Inj		
### Or which in injusts usable for technological functions		10
Integrated channels (DI)		
Imput characteristic curve in accordance with IEC 61131. type 1 Number of simulatineously controllable inputs Provided installation	· · · · · · · · · · · · · · · · · · ·	
Number of simultaneously controllable inputs herizontal installation — up to 40 °C, max. — up to 60 °C, max. — 5 vertical installation — up to 40 °C, max. 5 Input votation • Rated value (DC) • for signal "7 — 3 to +5V • for signal "1" • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 8 mA Imput carrent • for signal "1", typ. 9 max Imput carrent • for signal "1", typ. 1 max Imput carrent • for signal "1", typ. 1 max Imput carrent • for signal "1", typ. 1 max Imput carrent • for signal "1", typ. Imput carrent • fo		
horizontal installation - up to 40 °C, max, 5 vertical installation - up to 60 °C, max, 5 vertical installation - up to 40 °C, max, 5 structure in stallation - up to 40 °C, max, 5 structure installation - up to 40 °C, max, 5 structure installation - up to 40 °C, max, 5 structure installation - up to 40 °C, max, 5 structure installation - structure installation - structure installation - or signal °C °C		
- up to 40 °C, max.		
vertical installation — up to 40 °C, max. 1 post voltage • Rafed value (DC) • for signal °C' • for signal		10
vertical installation — up to 40°C, max. 5 linear votage • Rated value (DC) • for signal "1" • for signal "1", typ. 8 mA Input current • for signal "1", typ. 8 mA Sama	•	
input voltage Rated value (DC) of ro signal "0" of signal "1" of ro signal "1" of ro signal "1" of signal "1", typ. Input ceurest of ro signal "1", typ. Input ceurest of ro signal "1", typ. Ama of signal "1", typ. Ama of signal "1", typ. of signal "1", typ. Ama of signal "1", typ. of signal "1", typ. Ama of signal "1", typ. On the standard inputs of technological functions of which high-speed outputs of technological functions of technologic		•
input voltage Rated value (DC) of or signal "1" of or signal "1" of or signal "1", typ. Input current of or signal "1", typ. Input delay (for rated value of input voltage) for standard inputs — parameterizable — p		5
Rated value (DC) of or signal 1" of or signal 1" this to 30 V Input celay (for rated value of input voltage) for standard inputs — parameterizable — parameterizable — Rated value — Rated value — Rated value — at "0" to "1", max. 48 µs; Minimum pulse width/minimum pause between pulses at maximum counting frequency — at "0" to "1", max. 48 µs; Minimum pulse width/minimum pause between pulses at maximum counting frequency Cable length • shielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, finac. — at "10" to "1", max. Digital outputs • of which high-speed outputs • of which high-speed outputs • of which high-speed outputs • Necessore brreahold, typ. I A Limitation of inductive shutdown voltage to Controlling a digital input Switching capacity of the outputs • on lamp load, max. • on samp load, max. • on samp load, max. • on samp load, max. • of signal "1", min. Output loutgae • for signal "1", min. Output initing and "1" permissible range, min. • for signal "1" permissible range, max. • of signal "1" minimum load current • of signal "1" minimum load current, max. • of		
• for signal "0" +3 to +5V +15 to +30 V	· · ·	24 V
* for signal *1"		
Input current		
For signal 11*, typ. 8 mA		
Input delay (for rated value of input voltage) for standard inputs	·	8 mA
for standard inputs		
— parameterizable		
for technological functions - at "0" to "1", max. 48 μs; Minimum pulse width/minimum pause between pulses at maximum counting frequency Cable length • shielded, max. • unshielded, max. 600 m; for technological functions: No for technological functions - shielded, max. 100 m; at maximum count frequency not allowed Digital outputs Number of digital outputs • of which high-speed outputs integrated channels (DO) 6 Short-circuit protection 7 kesponse threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Yes Switching capacity of the outputs • lower limit 4 kΩ Load resistance range • lower limit 4 kΩ Output voltage • for signal "1", min. L+ (-0.8 V) Output current • for signal "1" permissible range, min. • for signal "1" permissible range, max. • for signal "0" residual current, max. • for signal "0" residual current, max. • for uprating		inputs during program runtime. Please note that under certain circumstances
- at *0° to *1", max. 48 μs; Minimum pulse width/minimum pause between pulses at maximum counting frequency Cable length • shielded, max. • unshielded, max. 600 m; for technological functions: No - shielded, max. 100 m; at maximum count frequency - unshielded, max. 100 m; at maximum count frequency - unshielded, max. 100 m; at maximum count frequency not allowed Digital outputs • of which high-speed outputs • of which high-speed outputs • Response threshold, typ. 1 A Limitation of inductive shutdown voltage to Controlling a digital input • Response threshold input Switching capacity of the outputs • on lamp load, max. Load resistance range • lower limit • upper limit 48 Ω • upper limit 48 Ω Cutput voltage • for signal *1", min. Cutput current • for signal *1" permissible range, min. • for signal *1" permissible range, max. • for signal *1" minimum load current • for signal *1" minimum load current • for uprating • for uprating • for redundant control of a load • Yes Switching frequency	— Rated value	3 ms
counting frequency Cable length • shielded, max. • unshielded, max. • unshielded, max. - on high a uotputs • of which high-speed outputs • of which high-speed outputs • of which high-speed outputs • Response threshold, typ. - Limitation of inductive shutdown voltage to - L+ (-48 V) Controlling a digital input Yes Switching capacity of the outputs • on lamp load, max. - on lamp load, max. - on lamp load, max. - or signal "1", min. - or or signal "1", min. - or or signal "1" rated value • for signal "1" repremissible range, min. • for signal "1" permissible range, max. • on signal "1" repremissible range, max. • or signal "1" repremissible range, max. • for signal "0" residual current, max. - on signal "1" reprimismum load current • for signal "0" residual current, max. - on signal "0" residual current, max. - on signal "1" minimum load current • for signal "0" residual current, max. - on signal "1" minimum load current • for signal "0" residual current, max. - on signal "0" residua	Ţ	
• shielded, max. • unshielded, max. 600 m; 100 m for technological functions 600 m; for technological functions: No for technological functions — shielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — of which high-speed outputs • of which high-speed outputs 2; Notice: You cannot connect the fast outputs of your CPU in parallel integrated channels (DO) 6 Short-circuit protection • Response threshold, typ. — Limitation of inductive shutdown voltage to Controlling a digital input Yes Switching capacity of the outputs • on lamp load, max. Load resistance range • lower limit 48 Ω upper limit 48 Ω Output voltage • for signal "1" min. Uutput voltage • for signal "1" rated value • for signal "1" rated value • for signal "1" reprmissible range, min. • for signal "1" permissible range, max. • for signal "1" remissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. Parallel switching of two outputs • for upratting • for redundant control of a load Switching frequency	— at "0" to "1", max.	
Unshielded, max. for technological functions — shielded, max. — unshielded, max. — unshielded, max. — unshielded, max. — unshielded, max. 100 m; at maximum count frequency — unshielded, max. Number of digital outputs Number of digital outputs 8	•	
for technological functions — shielded, max. — unshielded, max. — unshielded, max. Number of digital outputs Number of digital outputs • of which high-speed outputs integrated channels (DO) Short-circuit protection • Response threshold, typ. Limitation of inductive shutdown voltage to L+ (-48 V) Controlling a digital input Switching capacity of the outputs • on lamp load, max. Load resistance range • lower limit • upper limit Output voltage • for signal "1" rated value • for signal "1" rated value • for signal "1" permissible range, min. • for signal "1" permissible range, max. • for signal "1" permissible range, max. • for signal "1" residual current, max. Parallel switching of two outputs • for uprating • for redundant control of a load Switching frequency	shielded, max.	
- shielded, max. - unshielded, max. - unshielded, max. Digital outputs Number of digital outputs • of which high-speed outputs integrated channels (DO) Short-circuit protection • Response threshold, typ. Limitation of inductive shutdown voltage to Controlling a digital input Switching capacity of the outputs • on lamp load, max. Load resistance range • lower limit • upper limit • for signal "1" rated value • for signal "1" reted value • for signal "1" permissible range, min. • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "1" minimum load current • for signal "1" minimum load current • for signal "1" remissible range, max. • for signal "1" minimum load current • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "1" minimum load current • for signal "1" permissible range, max. • for signal "0" residual current, max. Parallel switching of two outputs • for uprating • for redundant control of a load Switching frequency	• unshielded, max.	600 m; for technological functions: No
Digital outputs 6	for technological functions	
Digital outputs ● of which high-speed outputs 2; Notice: You cannot connect the fast outputs of your CPU in parallel integrated channels (DO) 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 Load resistance range 6 over limit 48 Ω • lower limit 4 kΩ Output voltage for signal "1", min. L+ (-0.8 V) Output current 5 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 Parallel switching of two outputs No • for redundant control of a load Yes Switching frequency	— shielded, max.	100 m; at maximum count frequency
Number of digital outputs of which high-speed outputs 2; Notice: You cannot connect the fast outputs of your CPU in parallel integrated channels (DO) Short-circuit protection Yes; Clocked electronically • Response threshold, typ. 1 A Limitation of inductive shutdown voltage to Controlling a digital input Yes Switching capacity of the outputs on lamp load, max. 5 W Load resistance range lower limit 48 Ω upper limit 4 kΩ Output voltage of or signal "1", min. L+(-0.8 V) Output current of or signal "1" permissible range, min. of or signal "1" permissible range, max. of or signal "1" minimum load current of or signal "1" minimum load current of or signal "0" residual current, max. Parallel switching of two outputs of or redundant control of a load Switching frequency	— unshielded, max.	not allowed
of which high-speed outputs integrated channels (DO) Short-circuit protection		
integrated channels (DO) Short-circuit protection Pessponse threshold, typ. I A Limitation of inductive shutdown voltage to Controlling a digital input Pes Switching capacity of the outputs on lamp load, max. tower limit ABA upper limit ABA Output voltage of or signal "1", min. Cutput current of or signal "1" rated value of or signal "1" permissible range, min. of or signal "1" prisible range, max. of or signal "1" minimum load current of or signal "1" minimum load current of or signal "1" residual current, max. Parallel switching of two outputs of or redundant control of a load Switching frequency		6
Short-circuit protection Response threshold, typ. Limitation of inductive shutdown voltage to L+ (-48 V) Controlling a digital input Yes Switching capacity of the outputs on lamp load, max. 5 W Load resistance range lower limit upper limit 4 kΩ Output voltage for signal "1", min. L+ (-0.8 V) Output current of or signal "1" rated value for signal "1" permissible range, min. for signal "1" permissible range, max. of or signal "1" minimum load current of or signal "1" minimum load current for signal "0" residual current, max. for signal "0" residual current, max. Parallel switching of two outputs of or redundant control of a load Switching frequency	of which high-speed outputs	2; Notice: You cannot connect the fast outputs of your CPU in parallel
Response threshold, typ. Limitation of inductive shutdown voltage to L + (-48 V) Controlling a digital input Yes Switching capacity of the outputs on lamp load, max. 5 W Load resistance range lower limit supper limit for signal "1", min. of or signal "1" permissible range, min. of or signal "1" permissible range, max. of or signal "1" permissible range, max. of or signal "1" permissible range, max. of or signal "1" minimum load current of or signal "0" residual current, max. Parallel switching of two outputs of or redundant control of a load Switching frequency 1 A L + (-48 V) L + (-48 V) Cutut L + (-48 V) E	integrated channels (DO)	6
Limitation of inductive shutdown voltage to Controlling a digital input Yes Switching capacity of the outputs on lamp load, max. 5 W Load resistance range lower limit upper limit upper limit for signal "1", min. L+ (-0.8 V) Output current of or signal "1" rated value for signal "1" permissible range, min. of or signal "1" permissible range, max. of or signal "1" minimum load current for signal "1" minimum load current of or signal "0" residual current, max. Parallel switching of two outputs of or redundant control of a load Switching frequency	Short-circuit protection	Yes; Clocked electronically
Controlling a digital input Switching capacity of the outputs on lamp load, max. 5 W Load resistance range lower limit upper limit 48 \Q upper limit 44 \Q Output voltage for signal "1", min. L+ (-0.8 V) Output current for signal "1" rated value for signal "1" permissible range, min. for signal "1" permissible range, max. for signal "1" minimum load current for signal "1" minimum load current for signal "0" residual current, max. Parallel switching of two outputs for redundant control of a load Switching frequency		
Switching capacity of the outputs on lamp load, max. 5 W Load resistance range lower limit 48 Ω upper limit 4 kΩ Output voltage for signal "1", min. L+ (-0.8 V) Output current for signal "1" rated value for signal "1" permissible range, min. for signal "1" permissible range, max. for signal "1" minimum load current for signal "0" residual current, max. Parallel switching of two outputs for redundant control of a load Switching frequency		L+ (-48 V)
on lamp load, max. Load resistance range lower limit		Yes
Load resistance range • lower limit • upper limit 4 kΩ Output voltage • for signal "1", min. Output current • for signal "1" rated value • for signal "1" permissible range, min. • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. Parallel switching of two outputs • for uprating • for redundant control of a load Switching frequency		
 lower limit upper limit 4 kΩ Output voltage for signal "1", min. L+ (-0.8 V) Output current for signal "1" rated value for signal "1" permissible range, min. for signal "1" permissible range, max. for signal "1" minimum load current for signal "1" minimum load current for signal "0" residual current, max. O.5 mA Parallel switching of two outputs for uprating for redundant control of a load Switching frequency No Switching frequency 		5 W
 upper limit Output voltage for signal "1", min. L+ (-0.8 V) Output current for signal "1" rated value for signal "1" permissible range, min. for signal "1" permissible range, max. for signal "1" minimum load current for signal "0" residual current, max. Parallel switching of two outputs for uprating for redundant control of a load Switching frequency 		
Output voltage • for signal "1", min. L+ (-0.8 V) Output current • for signal "1" rated value • for signal "1" permissible range, min. • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. Parallel switching of two outputs • for uprating • for redundant control of a load Switching frequency		
for signal "1", min. Output current for signal "1" rated value for signal "1" permissible range, min. for signal "1" permissible range, max. for signal "1" minimum load current for signal "0" residual current, max. Parallel switching of two outputs for uprating for redundant control of a load Switching frequency L+ (-0.8 V) 500 mA 5 mA 0.6 A 0.5 mA No Ves		4 kΩ
Output current • 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 Parallel switching of two outputs • for uprating No • for redundant control of a load Yes Switching frequency	-	
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 Parallel switching of two outputs for uprating No for redundant control of a load Yes Switching frequency		L+ (-0.8 V)
for signal "1" permissible range, min. for signal "1" permissible range, max. o.6 A for signal "1" minimum load current for signal "0" residual current, max. Parallel switching of two outputs for uprating for redundant control of a load Switching frequency Switching frequency Smitching frequency Smitching frequency	·	
for signal "1" permissible range, max. ofor signal "1" minimum load current for signal "0" residual current, max. Parallel switching of two outputs ofor uprating for redundant control of a load Switching frequency O.6 A 5 mA 0.5 mA No Yes		
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		
for signal "0" residual current, max. Parallel switching of two outputs for uprating No for redundant control of a load Switching frequency 0.5 mA No Yes		0.6 A
Parallel switching of two outputs • for uprating • for redundant control of a load Yes Switching frequency		5 mA
 for uprating for redundant control of a load Switching frequency 		0.5 mA
• for redundant control of a load Yes Switching frequency	Parallel switching of two outputs	
Switching frequency	• for uprating	No
• • •	for redundant control of a load	Yes
• with resistive load, max. 100 Hz	Switching frequency	
	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
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	2 A
— up to 60 °C, max.	1.5 A
vertical installation	
— up to 40 °C, max.	1.5 A
Cable length	
shielded, max.	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), max.	1.5 mA
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
Interface types	
• RS 485	Yes
Output current of the interface, max.	200 mA
Protocols	200 11111
• MPI	Yes
PROFIBUS DP master	No
PROFIBUS DP device	No
Point-to-point connection	No
MPI	NO
	187.5 kbit/s
Transmission rate, max. Services	107.3 KUUS
— PG/OP communication	Vec
	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
Protocols	
PROFIsafe	No
communication functions / header	
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, transmitter, max.Number of GD packets, receiver, max.	8 8
•	

a Cita of CD packet (of which consistent) may	22 byta
Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	v.
• 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	6
usable for PG communication	5
— reserved for PG communication	1
— adjustable for PG communication, min.	1
adjustable for PG communication, max.	5
usable for OP communication	5
— reserved for OP communication	1
 adjustable for OP communication, min. 	1
adjustable for OP communication, max.	5
 usable for S7 basic communication 	2
 reserved for S7 basic communication 	0
 adjustable for S7 basic communication, min. 	0
 adjustable for S7 basic communication, max. 	2
S7 message functions	
Number of login stations for message functions, max.	6; Depending on the configured connections for PG/OP and S7 basic
	communication
	communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	
simultaneously active Alarm-S blocks, max. Test commissioning functions	Yes 300
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block	Yes 300 Yes; Up to 2 simultaneously
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step	Yes 300 Yes; Up to 2 simultaneously Yes
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints	Yes 300 Yes; Up to 2 simultaneously
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control	Yes 300 Yes; Up to 2 simultaneously Yes 4
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max.	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max.	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max.	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing • Forcing	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing • Forcing • Forcing, variables	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing • Forcing • Forcing • Forcing, variables • Number of variables, max.	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing • Forcing • Forcing, variables • Number of variables, max. Diagnostic buffer	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control • Status/control variable • Variables • Number of variables, max. — of which status variables, max. — of which control variables, max. Forcing • Forcing • Forcing, variables • Number of variables, max. Diagnostic buffer • present	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max.	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes 500
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes 500 No
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes Soo No 100; Only the last 100 entries are retained
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max.	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes 500 No 100; Only the last 100 entries are retained 499
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes Soo No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable preset	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes 500 No 100; Only the last 100 entries are retained 499
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable preset Service data	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes Inputs, outputs 10 Yes 500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable preset Service data can be read out	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes Soo No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable preset Service data can be read out Interrupts/diagnostics/status information	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes Inputs, outputs 10 Yes 500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable preset Service data can be read out Interrupts/diagnostics/status information Diagnostics indication LED	Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes 500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10 Yes
simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Single step Number of breakpoints Status/control Status/control variable Variables Number of variables, max. of which status variables, max. of which control variables, max. Forcing Forcing Forcing, variables Number of variables, max. Diagnostic buffer present Number of entries, max. adjustable of which powerfail-proof Number of entries readable in RUN, max. adjustable preset Service data can be read out Interrupts/diagnostics/status information	Yes 300 Yes; Up to 2 simultaneously Yes 4 Yes Inputs, outputs, memory bits, DB, times, counters 30 30 14 Yes Inputs, outputs 10 Yes Inputs, outputs 10 Yes 500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10

Integrated Functions	
Frequency measurement	Yes
Number of frequency meters	2; up to 10 kHz (see "Technological Functions" manual)
controlled positioning	No
integrated function blocks (closed-loop control)	No
PID controller	No
Number of pulse outputs	2; 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	100
Potential separation digital outputs	Yes
between the channels	No
between the channels and backplane bus	Yes
Isolation	
Isolation tested with	600 V DC
Ambient conditions	
Ambient temperature during operation	
min.	0 °C
• max.	60 °C
configuration / header	
Configuration software	
STEP 7	Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP
• OTEL 7	203
STEP 7 Lite	No
configuration / programming / header	
 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
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	80 mm
	125 mm
neight	
Height Depth	130 mm
Depth	130 mm
	130 mm 410 g

last modified:

