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

Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) 24 V 19.2 V 28.8 V		
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) permissible range, lower limit (DC) permissible range, upper limit (DC) permiss	General information	
Engineering with Programming package STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203 Supply votrage Rated value (DC) permissible range, lower limit (DC) external protection for power supply lines (recommendation) Mains buffering Mains buffering Mains/voltage failure stored energy time Repeat rate, min. 1 s Load voltage L+ Digital inputs Rated value (DC) Reverse polarity protection Yes Digital outputs Rated value (DC) Reverse polarity protection No Input current Current consumption (rated value) Current consumption (rated value) Current consumption (rated value) Current consumption (rated value) Form load voltage L+ (without load), max. Promor loas Promor loas Power loss typ. Memory Work memory Plug-in (MMC)	HW functional status	01
● Programming package SUEP 7 V 5.5 + SP1 or higher or STEP 7 V 5.3 + SP2 or higher with HSP 203 SUPPLY voltage Rated value (DC) permissible range, lower limit (DC) external protection for power supply lines (recommendation) Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Load voltage L+ Digital inputs — Rated value (DC) — Reverse polarity protection Digital outputs — Rated value (DC) — Reverse polarity protection No Input current Current consumption (rated value) • From load voltage L+ (without load), max. Digital inputs • from load voltage L+ (without load), max. Power loss Power loss Power loss, typ. Power loss, typ. • Integrated • expandable Load memory • Plug-in (MMC) • Plug-in (M	Firmware version	V3.3
Rated value (DC) permissible range, upper limit (PC) permissible range, upper limit (PC) permissible range, upper limit (PC) permissible range, upper limits (PC) permissib	Engineering with	
Rated value (DC)	Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
permissible range, lower limit (DC) permissible range, upper limit (DC) external protection for power supply lines (recommendation) Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Load voltage L+ Digital inputs — Rated value (DC) — Reverse polarity protection Pated value (DC) — Reverse polarity protection Pigital outputs — Rated value (DC) — Reverse polarity protection No Input current Current consumption (rated value) Current consumption (rated value) Current consumption (rated value) Form load voltage L+ (without load), max. Digital inputs • from load voltage L+ (without load), max. Digital outputs • from load voltage L+, max. Fower loss Power loss Power loss Power loss Power loss Power loss Power loss, typ. 12 W Memory Work memory • integrated • expandable • Repeat rate, min. 1 s Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min 4 A A A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min 4 A A A Big all authors S ms S ms S ms S o mA So mA Digital outputs • from load voltage L+ (without load), max. S o mA Digital outputs • from load voltage L+, max. 50 mA Power loss Power loss Power loss Power loss Power loss B Mbyte • expandable No Load memory • Plug-in (MMC), max. B Mbyte • Data management on MMC (after last programming), 10 a	Supply voltage	
permissible range, upper limit (DC) external protection for power supply lines (recommendation) Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Load voltage L+ Digital inputs — Rated value (DC) — Reverse polarity protection Digital outputs — Rated value (DC) — Reverse polarity protection No Input current Current consumption (rated value) Current consumption (in no-load operation), typ. Inrush current, typ. Pt 0.7 A²-s Digital outputs • from load voltage L+ (without load), max. Power loss Power loss Power loss, typ. Memory Ves Load memory • linegrated • expandable No Load memory • Plug-in (MMC) • Data management on MMC (after last programming), Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker, type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker, type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker, type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker, type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker, type B, min 4 A Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker, type B, min 4 A S ms S ms Form load voltage L+ (min. 2 A; miniature circuit breaker, type B, min 4 A No No No No No No No No No N	Rated value (DC)	24 V
external protection for power supply lines (recommendation) Mains buffering Mains buffering Mains Notlage failure stored energy time Repeat rate, min. Load voltage L+ Digital inputs Rated value (DC) Reverse polarity protection Paverse polarity protection No Input current Current consumption (rated value) Current consumption (rated value) Pit Digital inputs O, 7A²-s Digital inputs From load voltage L+ (without load), max. From load voltage L+ (without load), max. Power loss Power loss, typ. Power loss, typ. Pit ging in (MMC) Pit Ja Robert St. (AMC) No Mainsture circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min 4 A S ms S ms 5 ms 5 ms 1 s 5 ms 1 s 5 ms 1 s 6 fom 1 s 6 fom A 6 fom A 6 fom Ma 1 s 8 o mA 1 s 8 o mA 1 s 8 o mA 1 s 1 s 1 s 1 s 1 s 1 s 1 s 1	permissible range, lower limit (DC)	19.2 V
Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Load voltage L+ Digital inputs — Rated value (DC) — Reverse polarity protection Pigital outputs — Rated value (DC) — Reverse polarity protection No Input current Current consumption (rated value) Current consumption (rated value) 650 mA Current consumption (in no-load operation), typ. 150 mA Inrush current, typ. 5 A Pt 0,7 A²-s Digital inputs • from load voltage L+ (without load), max. 80 mA Digital outputs • from load voltage L+, max. Power loss Power loss Power loss, typ. 12 W Memory Work memory • integrated • expandable No Load memory • Plug-in (MMC), max. • Plug-in (MMC), max. • B Mbyte • Plug-in (MMC), max. • B Mbyte • Plug-in (MMC), max. • B Mbyte • Data management on MMC (after last programming), 10 a	permissible range, upper limit (DC)	28.8 V
Mains/voltage failure stored energy time Repeat rate, min. Load voltage L+ Digital inputs Rated value (DC) Reverse polarity protection Yes Digital outputs Rated value (DC) Reverse polarity protection No Input current Current consumption (rated value) Current consumption (in no-load operation), typ. Pt O, 7 A²s Digital inputs from load voltage L+ (without load), max. So mA Digital outputs from load voltage L+, max. From load voltage L+, max. Fower loss, typ. Memory Work memory Pilug-in (MMC) P	external protection for power supply lines (recommendation)	Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A
● Repeat rate, min. 1 s Load voltage L+ Digital inputs	Mains buffering	
Load voltage L+ Digital inputs Rated value (DC) Reverse polarity protection Pigital outputs Reverse polarity protection No Input current Current consumption (rated value) Gos mA Current consumption (in no-load operation), typ. Inrush current, typ. From load voltage L+ (without load), max. Form load voltage L+, max. Form load voltage L+, max. Power loss, typ. Power loss, typ. Integrated In	Mains/voltage failure stored energy time	5 ms
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 Pt 0.7 A²-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 • integrated 128 kbyte • expandable No Load memory • Plug-in (MMC) • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), 10 a	Repeat rate, min.	1 s
Rated value (DC) Reverse polarity protection Yes Digital outputs Rated value (DC) Reverse polarity protection No Input current Current consumption (rated value) Inrush current, typ. Inrush current, typ. Inrush current, typ. Ipit Or from load voltage L+ (without load), max. Ingital outputs Inform load voltage L+, max. Power loss Power loss, typ. Integrated	Load voltage L+	
Pewer loss, typ. Power loss, typ. Piggrated • expandable • ex	Digital inputs	
Digital outputs — Rated value (DC) — Reverse polarity protection No Input current Current consumption (rated value) Current consumption (in no-load operation), typ. 150 mA Inrush current, typ. 5 A IPt 0,7 A²-s Digital inputs • from load voltage L+ (without load), max. 80 mA Digital outputs • from load voltage L+, max. 50 mA Power loss, typ. 12 W Memory Work memory • integrated • expandable • expandable No Load memory • Plug-in (MMC) • Plug-in (MMC)	— Rated value (DC)	24 V
Rated value (DC) Reverse polarity protection No Input current Current consumption (rated value) Current consumption (in no-load operation), typ. 150 mA Inrush current, typ. 5 A I*t 0.7 A²-s Digital inputs • from load voltage L+ (without load), max. 80 mA Digital outputs • from load voltage L+, max. 50 mA Power loss, typ. 12 W Memory Work memory • integrated • expandable • expandable • Plug-in (MMC) • Plug-in (MMC) • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), 10 a	 Reverse polarity protection 	Yes
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 If t 0.7 A²-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 Load memory • Plug-in (MMC) Yes • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), 10 a	Digital outputs	
Current consumption (rated value) 650 mA Current consumption (in no-load operation), typ. 150 mA Inrush current, typ. 5 A IPt 0.7 A2-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 Load memory • Plug-in (MMC) Yes • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), 10 a	— Rated value (DC)	24 V
Current consumption (rated value) 650 mA Current consumption (in no-load operation), typ. 150 mA Inrush current, typ. 5 A It 0.7 A²-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 Load memory • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), 10 a	 Reverse polarity protection 	No
Current consumption (in no-load operation), typ. Inrush current, typ. 5 A Pt 0.7 A²-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 • expandable • expandable Load memory • Plug-in (MMC) • Plug-in (MMC), max. • Data management on MMC (after last programming), • Data management on MMC (after last programming), 150 mA 120 mA	Input current	
Inrush current, typ. 5 A I²t 0.7 A²·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 Load memory • Plug-in (MMC) Yes • Plug-in (MMC), max. 8 Mbyte • Data management on MMC (after last programming), 10 a	Current consumption (rated value)	650 mA
Pigtal inputs 0.7 A²-s	Current consumption (in no-load operation), typ.	150 mA
Digital inputs	Inrush current, typ.	5 A
• from load voltage L+ (without load), max. • from load voltage L+, max. • from load voltage L+, max. • from load voltage L+, max. Fower loss Power loss, typ. Power loss, typ. Work memory • integrated • expandable • expandable • load memory • Plug-in (MMC) • Plug-in (MMC), max. • Data management on MMC (after last programming), • In a so maximum services and so maximum ser	l²t	0.7 A ² ·s
Digital outputs	Digital inputs	
● from load voltage L+, max. 50 mA Power loss, typ. 12 W Memory Work memory ● integrated 128 kbyte ● expandable No Load memory ● Plug-in (MMC) Yes ● Plug-in (MMC), max. ● Data management on MMC (after last programming), 10 a	• from load voltage L+ (without load), max.	80 mA
Power loss, typ. 12 W Memory Work memory integrated expandable No Load memory Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 10 a	Digital outputs	
Power loss, typ. Memory Work memory integrated expandable volumemory Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 12 W 13 W 14 W 15 W 16 W 17 W 18 W 19 W	• from load voltage L+, max.	50 mA
Work memory integrated 128 kbyte expandable No Load memory Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 10 a	Power loss	
Work memory integrated expandable No Load memory Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 10 a	Power loss, typ.	12 W
 integrated expandable No Load memory Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 10 a 	Memory	
 expandable No Load memory Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 10 a 	Work memory	
Load memory Plug-in (MMC) Plug-in (MMC), max. Plug-in (MMC), max. Data management on MMC (after last programming), 10 a	• integrated	128 kbyte
 Plug-in (MMC) Plug-in (MMC), max. Data management on MMC (after last programming), 10 a 	expandable	No
 Plug-in (MMC), max. Data management on MMC (after last programming), 10 a 	Load memory	
Data management on MMC (after last programming), 10 a	• Plug-in (MMC)	Yes
	 Plug-in (MMC), max. 	8 Mbyte
		10 a

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
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be
DB	reduced by the MMC used.
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
— adjustable — lower limit	Yes 0
•	
— lower limit	0
lower limitupper limit	0 255
— lower limit— upper limit— preset	0 255
lower limit upper limit preset Counting range lower limit	0 255 Z 0 to Z 7
lower limit upper limit preset Counting range	0 255 Z 0 to Z 7
lower limit upper limit preset Counting range lower limit upper limit IEC counter	0 255 Z 0 to Z 7
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter ● present	0 255 Z 0 to Z 7 0 999
lower limit upper limit preset Counting range lower limit upper limit IEC counter	0 255 Z 0 to Z 7 0 999 Yes SFB
- lower limit - upper limit - preset Counting range - lower limit - upper limit IEC counter • present • Type	0 255 Z 0 to Z 7 0 999
- lower limit - upper limit - preset Counting range - lower limit - upper limit IEC counter • present • Type • Number	0 255 Z 0 to Z 7 0 999 Yes SFB
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity)
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity)
— lower limit — upper limit — preset Counting range — lower limit — upper limit IEC counter • present • Type • Number S7 times • Number Retentivity — adjustable	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit upper limit	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0 255
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit upper limit upper limit preset	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit upper limit upper limit preset Time range	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0 255 No retentivity
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit upper limit upper limit preset Time range lower limit	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0 255 No retentivity
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit upper limit preset Time range lower limit upper limit	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0 255 No retentivity
lower limit upper limit preset Counting range lower limit upper limit IEC counter • present • Type • Number S7 times • Number Retentivity adjustable lower limit upper limit upper limit preset Time range lower limit	0 255 Z 0 to Z 7 0 999 Yes SFB Unlimited (limited only by RAM capacity) 256 Yes 0 255 No retentivity

• Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	Chamber (minious char) 2) 12 am capacity)
Retentive data area (incl. timers, counters, flags), max.	64 kbyte
Flag	0.110,10
• Size, max.	256 byte
Retentivity available	Yes; MB 0 to MB 255
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	
 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	404.04.400.7
— 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	4.040
• Inputs	1 016
— of which central	1 016
Outputs of which control	1 008 1 008
— of which central Analog channels	1 000
	253
Inputs — 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
Time of day	
Clock	
Hardware clock (real-time)	Yes
retentive and synchronizable	Yes
Backup time	6 wk; At 40 °C ambient temperature
•	

a Deviation per dev. may	10 o: Tvp : 2 o
Deviation per day, max. Dehavior of the plant following DOWED ON.	10 s; Typ.: 2 s
 Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period 	Clock continues running after POWER OFF
	the clock continues at the time of day it had when power was switched off
Operating hours counter • Number	1
	0
Number/Number range Pange of values	
Range of values Crouderity	0 to 2^31 hours (when using SFC 101) 1 h
Granularity	
retentive Clock synchronization	Yes; Must be restarted at each restart
-	Yes
• supported	Yes
• to MPI, master	
• to MPI, slave	Yes
• in AS, master	Yes
• in AS, slave	No
Digital inputs	24
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	1 000 m; 100 m for toohnological finations
• shielded, max.	1 000 m; 100 m for technological functions
• unshielded, max.	600 m; for technological functions: No
for technological functions	400
— 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.	1A
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	48 Ω
• upper limit	4 kΩ
Output voltage	

● for signal "1", min.	L+ (-0.8 V)
Output current	L+ (-0.0 V)
• for signal "1" rated value	500 mA
• for signal "1" permissible range, min.	5 mA
for signal "1" permissible range, max.	0.6 A
	5 mA
for signal "0" residual current for signal "0" residual current may	
for signal "0" residual current, max. Perellel switching of two curtouts	0.5 mA
Parallel switching of two outputs	Me
• for uprating	No Van
for redundant control of a load Cuitablian fraguency	Yes
Switching frequency	400 11-
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. The pure of the pulse outputs (figure provide).	2.5 kHz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	1000
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	4
 For voltage/current measurement 	4
For resistance/resistance thermometer measurement	1
integrated channels (AI)	5; 4x current/voltage, 1x resistance
permissible input voltage for current input (destruction limit), max.	5 V; Permanent
permissible input voltage for voltage input (destruction limit), max.	30 V; Permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA; Permanent
permissible input current for current input (destruction limit), max.	50 mA; Permanent
Electrical input frequency, max.	400 Hz
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 k Ω ; 0 V to 10 V / 100 k Ω
Current	Yes; ±20 mA / 100 Ω ; 0 mA to 20 mA / 100 Ω ; 4 mA to 20 mA / 100 Ω
Resistance thermometer	Yes; Pt 100 / 10 M Ω
Resistance	Yes; 0 Ω to 600 Ω / 10 M Ω
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 ΜΩ
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes

Thermosouple (TC) Temperature compensation — parameterizable — for resistance thermometer	Input registance (0 to 600 ohms)	10 MO
Temperature compensation - parameterizable Characteristic interactation • parameterizable - for resistance thermometer - for rotage output short-circuit current, max for MA - Current output, no-load voltage, max for to 10 V - for voltage output for write connection - for voltage output four write connection - for outpage output four write connection - for voltage output four write connection - for outpage output four four four four four four four four	— Input resistance (0 to 600 ohms)	10 ΜΩ
- parameterizable - Characterization Parameterizable Yes; by software - for resistance thermometer Pi 100 - sheided, max. 100 m - sheided, max. 100 m - sheided, max. 100 m - sheided, max. 2 - Vottage output. Sheided, max. 2 - Vottage output. short-circuit protection Yes - Vottage output. short-circuit current, max. 55 mA - Current output, no-food vottage, max. 14 V - Vottage output. short-circuit current, max. 55 mA - Current output, no-food vottage, max. 14 V - Vottage output. short-circuit current, max. 14 V - Vottage output. south or 20 mA Yes - Vottage output. south or 20 mA Yes - Vor vottage output two-wire connection Yes - Vor vottage output two-wire connection Yes - Vottage output two-wire connection Yes		
Characterisals insearcation parameterization - for resistance themometer - for resistance themometer - for resistance themometer - for resistance themometer - for the selection of the sel	·	
Parameterizable		No
shielded, max. Anatog outputs Number of analog outputs 100 m Number of analog outputs 2 Voltage output, short-circuit protection Yes Voltage output, short-circuit protection Yes Current output, no-load voltage, max. Voluput ranges, votage **O to 10 V **O **O 10 V **O **O **O **O **O **O **O **O **O **	•	·
Analog outputs		Pt 100
Analog outputs Number of analog outputs (AC) 2 Voltage output, short-circuit protection Yes Current output, no-load voltage, max. Current output, no-load voltage, max. (AV) - (10 Yo V Yes - (10 Yo +10 V Yes - (20 mA to +20 mA Yes - (20 mA	Cable length	
Number of analog outputs 2 2 2 2 2 2 2 2 2	• shielded, max.	100 m
Integrated channels (AO) Voltago output, short-circult protection Ves Voltago output, short-circult protection Ves Voltago output, short-circult protection Ves Voltago output, short-circult current, max. 55 mA Current output, no-load voltage, max. 0 to 10 V • 10 V to 10 V • 10 V to 10 V • 10 V to 10 V • 10 20 mA • 20 mA • 20 mA • 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 6 ro voltage output two-wire connection • for voltage output flor-wire connection • for voltage output flor-wire connection • for voltage output, smin. • 1 kD • with voltage output, smin. • with voltage output, smin. • with current outputs, max. • with current outputs towards MANA • Current, max Cable length • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Or oversion time (per channel) • Resolution of signal encoders • for oversion time (per channel) • for includive load • for includive load • for includive load • for oversion time (per chann	Analog outputs	
Voltage output, short-circuit protection Vetage output, short-circuit protection Voltage output, short-circuit current, max. 55 mA Current output, no-lead voltage, max. 14 V Cutput ranges, voltage • 0 to 10 V yes • 10 V to +10 V Yes • 10 V to +10 V Yes • 10 V to +10 V Yes • 20 mA to +20 mA • 20 mA • 20 mA • 20 mA to 20 mA • 7 ves • 6 ro voltage output four-wire connection • for voltage output, four-wire connection • for voltage output, four-wire connection • for voltage output, four-wire connection • vetage output, four-wire connection • for voltage output, four-wire connection • for voltage output, four-wire connection • with current output, include load, max. • or individual control to four-wire connection • voltage output, four-wire connection • voltage output, four-wire connection • Ves • Voltage output, four-wire connection • So mA: Permanent Cable length • shelded, max. 200 m Analog value generation for the inputs Measurement principle • shelded, max. • lintegration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • 12 bit • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • 12 bit • for resistive load • for resistive load • for or quality load • for or q	Number of analog outputs	2
Voltage output, short-circuit current, max. Current output, no-load voltage, max. 14 V Output ranges, voltage • 10 to 10 V Yes • 10 V 10 +10 V Output ranges, current • 0 to 20 mA • 20 m At 0 +20 mA • 4 m N to 20 mA • 4 m N to 20 mA • for voltage output flour-wire connection • for voltage output flour-wire connection • for voltage output flour-wire connection • for voltage output, flour-wire connection • for voltage output, flour-wire connection • for voltage output, short-connection • for voltage output, short-connection • for current output, how-wire connection • for voltage output, short-connection • with voltage output, spacitive load, max. • with current output, short-connection • with current output, short-connection • with current output, short-connection • voltages at the output short-connection • Voltages at the output short-connection • Shelded, max. • Current, max. Cable length • shelded, max. Analog value generation for the linputs Measurement principle • Resolution with overrange (bit including sign), max. • integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • integration and conversion time of the module (all channels released) • Time constant of the input filter • Resolution with overrange (bit including sign), max. • Integration and conversion time ferse button per channel • Resolution with overrange (bit including sign), max. • To conversion time (per channel) • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • Resolution of signal encoders • for circulative load • for includive load • for	integrated channels (AO)	2
Current output, no-load voltage, max. Cutput ranges, voltage • 0 to 1 of V • 10 V to +10 V • 20 mA • 20 mA to 20 mA • 20 mA to 20 mA • 20 mA to 20 mA • 7 wes Connection of actuators • for voltage output two-wire connection • for current output, since the since t	Voltage output, short-circuit protection	Yes
Output ranges, voltage • 0 to 10 V • 10 V 10 + 10 V Couput ranges, current • 0 to 20 mA • 2-0 mA to -20 mA • 4 mA to 20 mA • 4 mA to 20 mA • for voltage output four-wire connection • for voltage output, four-wire connection • for voltage output, generation of actuators • for voltage output, generation of current output two-wire connection • for current output two-wire connection • for current output, max • with voltage outputs, min. • with voltage outputs, generative load, max. • with current outputs, max • with current outputs, max • with current outputs, inductive load, max. • with current outputs, inductive load, max. • voltages at the outputs towards MANA • Voltages at the outputs towards MANA • Voltages at the outputs towards MANA • Outputs • Voltages at the outputs towards MANA • So mA; Permanent • Current, max. Cable length • shelded, max. Analog value generation for the inputs Measurement principle • Resolution with overrange (bit including sign), max. • Interference voltage suppression for interference frequency fil in ½ • Time constant of the input filter • Passic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (bit including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (bit including sign), max. • In the conversion time (per channel) • Resolution with overrange (bit including sign), max. • In the conversion time (per channel) • Resolution with overrange (bit including sign), max. • In the conversion time (per channel) • Resolution with overrange (bit including sign), max. • In the conversion time (per channel) • Resolution with overrange (bit including sign), max. • In the conversion time (per	Voltage output, short-circuit current, max.	55 mA
• 0 to 10 V • 10 V to +10 V • 10 V to +10 V • 10 V to +10 V • 10 V to +10 V • 10 V to +10 V • 10 V to +10 V • 10 V to +10 V • 20 mA to +20 mA • 20 mA to +20 mA • 20 mA to +20 mA • 20 mA to +20 mA • 4 m An to 20 mA • 7 ves • 6 ro voltage output four-wire connection • 6 ro voltage output four-wire connection • 6 ro current output knowire connection • 6 ro current output knowire connection • 6 ro underso output four-wire connection • 6 vinth voitage outputs, capacitive load, max. • with current outputs, min. • with voitage outputs, capacitive load, max. • with current outputs, max. • with current outputs, max. • with current outputs, max. • vinth current outputs, max. • Voltages at the outputs towards MANA • Current, max. • Voltages at the outputs towards MANA • Current, max. • Cable length • shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration inne, parameterizable • Integration inne, parameterizable • Integration inne, parameterizable • Integration inne, parameterizable • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel) • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel) • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel) • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel) • Resolution with overrange (bit including sign), max.	Current output, no-load voltage, max.	14 V
• -10 V to +10 V Output ranges, current • 0 to 2 0 mA • -20 mA to +20 mA • -20 mA to +20 mA • -4 mA to 20 mA • -7 wes • -7 or voltage output two-wire connection • for courrent output two-wire connection • for courrent output two-wire connection • for voltage output two-wire connection • for courrent output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, min. • with current outputs, min. • with current outputs, inductive load, max. • old the current outputs inductive load, max. • with current outputs inductive load, max. • old the current outputs inductive load, max. • old the current outputs inductive load, max. • old two current outputs inductive load, max. • old the current outputs Measurement principle • Resolution with overrange (thi including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (thi including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (thi including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (thi including sign), max. • Conversion time (per channel) • Resolution with overrange (thi including sign), max. • Conversion time (per channel) • Resolution of the outputs Integration of signal encoders • for includive load • for includive load • for for inductive load • for for voltage measurement • For voltage measurement • For voltage measurement	Output ranges, voltage	
Output ranges, current • 0 to 20 mA • 20 mA • 4 mA to 20 mA • 6 ro voltage output four-wire connection • for voltage output four-wire connection • for current output how-wire connection • for current output wo-wire connection • for current outputs, and content of the line resistances • for voltage output four-wire connection • for current outputs, expacitive load, max. • with voltage outputs, capacitive load, max. • with voltage outputs, capacitive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs is wards MANA • Current, max. • Voltages at the outputs towards MANA • Current, max. Cable length • shelded, max. Analog value generation for the inputs Measurement principle • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolut	• 0 to 10 V	Yes
• 0 to 20 mA • 20 mA to 20 mA • 20 mA to 20 mA • 2 m A to 20 mA • 2 m A to 20 mA Ves Connection of actuators • for voltage output two-wire connection • for voltage output four-wire connection • for voltage output two-wire connection • for voltage output two-wire connection • for current output two-wire connection • for current output two-wire connection • ves Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, max. • with current outputs, max. • with current outputs, inductive load, max. • Voltages at the outputs towards MANA • Current, max. • Current, max. • Current, max. • On max. • On max. • On max. • So max; Permanent • So max; Permanent • So max; Permanent • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time of the module (all channels released) • Resolution with overrange (bit including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (bit including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (bit including sign), max. • In max • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • In max • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • In max • Conversion time (per channel) • Resolution of for capacitive load • for capacitive load • for inductive load • for ovoltage measurement • For voltage measurement • For voltage measurement • For voltage measurement • Ves	• -10 V to +10 V	Yes
- 20 mA to +20 mA - 4 mA to 20 mA - 4 mA to 20 mA - 7 ves Connection of actuators - for voltage output two-wire connection - for voltage output four-wire connection - for voltage output four-wire connection - for outrent output two-wire connection - for current output two-wire connection - ves Load impedance (in rated range of output) - with voltage outputs, capacitive load, max with outrent outputs, inductive load, max with current outputs, inductive load, max with current outputs, inductive load, max with current outputs, inductive load, max voltages at the outputs towards MANA - Current, max Current, max Current, max So mA; Permanent - Shelded, max Analog value generation for the inputs - Resolution with overrange (bit including sign), max Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max Integration and conversion time of the module (all channels released) - Time constant of the input filter - Basic execution time of the module (all channels released) - Resolution with overrange (bit including sign), max Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max Integration and conversion time of the module (all channels released) - Time constant of the input filter - Basic execution time of the module (all channels released) - Time constant of the outputs - Integration and conversion time/resolution per channel - Resolution with overrange (bit including sign), max 12 bit - Conversion time (per channel) - Resolution with overrange (bit including sign), max 12 bit - Conversion time (per channel) - For resistive load - for resistive load - for resistive load - for inductive load - for inductive load - for voltage measurement - For voltage measurement - Ves	Output ranges, current	
• 4 mA to 20 mA Connection of actuators • for voltage output two-wire connection • for voltage output two-wire connection • for current output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs towards MANA • Current, max. Cable length • shielded, max. Analog value generation for the inputs Measurement principle • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration time, parameterizable • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Interference voltage suppression for interference frequency f1 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. 1 2 bit • Conversion time (per channel) Setting time • for resistive load • for capacitive load • for capacitive load • for capacitive load • for orapacitive load • for orapacitive load • for orapacitive load • for ovoltage measurement Yes • for voltage measurement	• 0 to 20 mA	Yes
Connection of actuators • for voltage output two-wire connection • for voltage output four-wire connection • for voltage output four-wire connection • for current output two-wire connection • for current output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, max. • with current outputs, apacitive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • Voltages at the outputs towards MANA • Current, max. Cable length • shelded, max. Analog value generation for the Inputs Measurement principle • Actual value encryption (successive approximation) Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration ime, parameterizable • Interference voltage suppression for interference frequency ff in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Interference voltage suppression for interference frequency ff in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • 12 bit • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • 12 bit • for resistive load • for capacitive load • for capacitive load • for orapacitive load • for orapacitive load • for orapacitive load • for orbitage measurement • For voltage measurement • Yes	• -20 mA to +20 mA	Yes
• for voltage output two-wire connection • for voltage output four-wire connection No • for current output two-wire connection Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • vith current outputs, inductive load, max. • vith current outputs, inductive load, max. • Voltages at the outputs towards MANA • Current, max. • Voltages at the outputs towards MANA • Current, max. Cable length • shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • integration time, parameterizable • Integration time, parameterizable • Integration time, parameterizable • Integration time, parameterizable • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • In ms • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • In ms • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • In ms • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • In ms • For includive load • For resistive load • For resistive load • For resistive load • For or resistive load • For or or of signal encoders • For voltage measurement • For voltage measurement Yes	• 4 mA to 20 mA	Yes
• for voltage output four-wire connection • for current output two-wire connection • for current output two-wire connection • with voltage outputs, min. • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with current outputs, max. • with current outputs, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • Voltages at the outputs towards MANA • Current, max. • Current, max. • So mA; Permanent • So mA; Permanent • Shielded, max. Analog value generation for the inputs • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz • Basic execution time of the moutputs • Basic execution time of the moutputs • Randog value generation for the moutputs • Resolution with overrange (bit including sign), max. • Integration and conversion time of the module (all channels released) Analog value generation for the outputs • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration and conversion time (per channel) • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • for resistive load • for capacitive load • for capacitive load • for for voltage measurement • for voltage measurement • for voltage measurement • for voltage measurement • for orbitage measurement • for voltage measurement • for orbitage measurement • for orbitage measurement • for voltage measurement • for orbitage outputs, and and an and aurents • for voltage measurement • for orbitage outputs, max. • for presistive load • for voltage measurement • for orbitage outputs, max. • for voltage outputs,	Connection of actuators	
• for current output two-wire connection Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, capacitive load, max. • with outrent outputs, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. O.1 μF • with current outputs, inductive load, max. O.1 mH Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA • Current, max. Cable length • shielded, max. Analog value generation for the inputs Measurement principle • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • I ms • Conversion time (per channel) Setting time • for resistive load • for capacitive load • for capacitive load • for crapacitive load • for for ductive load • for for signal encoders • for voltage measurement Yes	 for voltage output two-wire connection 	Yes; Without compensation of the line resistances
Load impedance (in rated range of output) • with voltage outputs, min. • with voltage outputs, max. • with current outputs, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • with current outputs, inductive load, max. • Voltages at the outputs towards MANA • Current, max. • Current, max. Cable length • Shielded, max. Analog value generation for the inputs Measurement principle • Resolution with overrange (bit including sign), max. • Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Interference voltage suppression for interference frequency 11 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • In ms released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • In ms settling time • for resistive load • for capacitive load • for capacitive load • for resistive load • for resistive load • for resistive load • for resistive load • for signal encoders • for voltage measurement Yes	 for voltage output four-wire connection 	No
with voltage outputs, min. with voltage outputs, capacitive load, max. with current outputs, max. with current outputs, inductive load, max. O.1 μF with current outputs, inductive load, max. O.1 mH Destruction limits against externally applied voltages and currents Voltages at the outputs towards MANA Current, max. So mA; Permanent Cable length shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable Integration time, parameterizable Integration time of the input filter Shasic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. In ms Conversion time (per channel) For capacitive load Resolution with overrange (bit including sign), max. In ms For conversion time (per channel) For capacitive load Resolution of signal encoders For voltage measurement For voltage measurement Yes	 for current output two-wire connection 	Yes
with voltage outputs, capacitive load, max. with current outputs, max. with current outputs, max. outputs inductive load, max. Destruction limits against externally applied voltages and currents Voltages at the outputs towards MANA if 6 V; Permanent Ourrent, max. Cable length shielded, max. Analog value generation for the inputs Measurement principle integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. integration time, parameterizable integration time, parameterizable integration time, parameterizable integration time on the input filter sasic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Ins Conversion time (per channel) For resistive load For capacitive load For capacitive load For inductive load For inductive load For overlage measurement Yes	Load impedance (in rated range of output)	
 with current outputs, max. with current outputs, inductive load, max. 0.1 mH Destruction limits against externally applied voltages and currents Voltages at the outputs towards MANA Current, max. Cable length shielded, max. Actual value generation for the inputs Measurement principle Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 1 ms Englaged to the input filter O.38 ms 1 ms Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 1 bit Conversion time (per channel) 1 ms Settling time for resistive load o.6 ms for capacitive load o.5 ms Encoder Connection of signal encoders for voltage measurement Yes 	with voltage outputs, min.	1 kΩ
with current outputs, inductive load, max. Destruction limits against externally applied voltages and currents Voltages at the outputs towards MANA Current, max. Cable length shelded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Resolution with overrange (bit including sign), max. Conversion time (per channel) Resolution with overrange (bit including sign), max. Conversion time (per channel) Resolution vith overrange (bit including sign), max. Conversion time (per channel) Resolution vith overrange (bit including sign), max. Conversion time (per channel) Resolution of signal encoders For or or of signal encoders For ovoltage measurement Yes	 with voltage outputs, capacitive load, max. 	0.1 µF
Destruction limits against externally applied voltages and currents • Voltages at the outputs towards MANA • Current, max. Cable length • shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • In ms • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • Time constant of the input filter • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • Time constant of the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • Time constant of the outputs In ms Settling time • for resistive load • for capacitive load • for capacitive load • for capacitive load • for capacitive load • for orditage measurement Final Value encryption (successive approximation) 1 to successive approxima	with current outputs, max.	300 Ω
Voltages at the outputs towards MANA Current, max. So mA; Permanent So mA; P	 with current outputs, inductive load, max. 	0.1 mH
Cable length • shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz • Time constant of the input filter • Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • Resolution with overrange (bit including sign), max. • Conversion time (per channel) • for resistive load • for capacitive load • for capacitive load • for inductive load • for inductive load • for inductive load • for voltage measurement • for voltage measurement 50 / 60 Hz 7 / 20 ms 50 / 60 Hz 1 ms 1 ms 2 bit 2 bit 3 bit 4 bit 4 bit 5 bit 6 ms 6 or inductive load 9 o.6 ms 6 or inductive load 9 o.5 ms Encoder Connection of signal encoders • for voltage measurement Yes	Destruction limits against externally applied voltages and currents	
Cable length	 Voltages at the outputs towards MANA 	16 V; Permanent
shielded, max. 200 m Analog value generation for the inputs Measurement principle Actual value encryption (successive approximation) Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 12 bit Integration time, parameterizable Yes; 16.6 / 20 ms Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter 0.38 ms Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. 12 bit Conversion time (per channel) 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	• Current, max.	50 mA; Permanent
Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable Integration time, parameterizable Integration time parameterizable Integration time of the input filter Impurity Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time for resistive load for capacitive load for capacitive load for capacitive load for inductive load Final Maxwell Settling time for voltage measurement Yes	Cable length	
Measurement principle Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time for resistive load for capacitive load for capacitive load for inductive load Final Actual value encryption (successive approximation) 12 bit Yes; 16.6 / 20 ms 50 / 60 Hz 1 ms 1 ms 1 ms 1 ms 1 ms 1 bit 1 bit 1 ms 1 bit 1 bit 1 ms 1 bit 1 ms 1 bit 1 bit 1 ms 1 ms 1 bit 1 ms 1 bit 1 ms 1 ms 1 bit 1 ms 1 bit 1 ms 1 ms 1 bit 1 ms 1 bit 1 ms 1 ms 1 bit 1 ms 1 ms 1 ms 1 ms 1 bit 1 ms 1 ms 1 ms 1 ms 1 bit 1 ms 1 ms 1 ms	shielded, max.	200 m
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time of reascitive load of capacitive load of or capacitive load of or inductive load Final description of signal encoders of or voltage measurement Yes	Analog value generation for the inputs	
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time of reasistive load of rapacitive load of or capacitive load of or inductive load of or inductive load of or signal encoders of or voltage measurement Yes		Actual value encryption (successive approximation)
Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time for resistive load for capacitive load for inductive load for inductive load for voltage measurement Yes		у при
Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time for capacitive load for capacitive load for inductive load for voltage measurement Yes; 16.6 / 20 ms 50 / 60 Hz 1 ms 1 ms 1 ms 1 ms 1 ms 1 bit 1 ms 1 bit 1 ms	-	12 hit
Interference voltage suppression for interference frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time of or resistive load of or capacitive load of or inductive load of or inductive load Find the module (all channels are in missing in missing in message) The module of the module (all channels are in missing in message) 1 ms Settling time of or resistive load of of or signal encoders of or voltage measurement Yes		
frequency f1 in Hz Time constant of the input filter Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time for resistive load for capacitive load for inductive load for inductive load Connection of signal encoders for voltage measurement Yes		
Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) 1 ms Settling time for resistive load for capacitive load for inductive load for inductive load Tims 0.5 ms Encoder Connection of signal encoders for voltage measurement Yes		
Basic execution time of the module (all channels released) Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) 1 ms Settling time for resistive load for capacitive load for inductive load for inductive load Tims 0.5 ms Encoder Connection of signal encoders for voltage measurement Yes	Time constant of the input filter	0.38 ms
Analog value generation for the outputs Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time of or resistive load of or capacitive load of or inductive load of or inductive load For inductive load Connection of signal encoders of or voltage measurement Yes	,	1 ms
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Conversion time (per channel) 1 ms Settling time for resistive load for capacitive load for inductive load for inductive load 1 ms 5 ms Encoder Connection of signal encoders for voltage measurement Yes	,	
Resolution with overrange (bit including sign), max. Conversion time (per channel) Settling time of or resistive load of or capacitive load of or inductive load of or inductive load Encoder Connection of signal encoders of or voltage measurement Yes		
Conversion time (per channel) Settling time of or resistive load of or capacitive load of or inductive load of or inductive load of or inductive load Encoder Connection of signal encoders of or voltage measurement Yes		
Settling time • for resistive load • for capacitive load • for inductive load • for inductive load • for inductive load Encoder Connection of signal encoders • for voltage measurement Yes	 Resolution with overrange (bit including sign), max. 	12 bit
for resistive load for capacitive load for inductive load for inductive load for inductive load for inductive load Connection of signal encoders for voltage measurement Yes	Conversion time (per channel)	1 ms
for capacitive load for inductive load 0.5 ms Encoder Connection of signal encoders for voltage measurement Yes	Settling time	
for inductive load 0.5 ms Encoder Connection of signal encoders for voltage measurement Yes	 for resistive load 	0.6 ms
Encoder Connection of signal encoders ● for voltage measurement Yes	for capacitive load	1 ms
Connection of signal encoders • for voltage measurement Yes	for inductive load	0.5 ms
• for voltage measurement Yes	Encoder	
	Connection of signal encoders	
• for current measurement as 2-wire transducer Yes: with external supply	for voltage measurement	Yes
To, with external supply	• for current measurement as 2-wire transducer	Yes; with external supply
• for current measurement as 4-wire transducer Yes	• for current measurement as 4-wire transducer	
• for resistance measurement with two-wire connection Yes; Without compensation of the line resistances	• 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 three-wire connection	·

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 input range), (+/-)	0.06 %
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)	0.00/ 1: ''
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, (+/-) Resistance thermometer relative to input range, (+/-)	0.8 %; Linearity error ±0.2 %
Resistance thermometer, relative to input range, (+/-) Veltage relative to entruit range, (+/-)	0.8 %
Voltage, relative to output range, (+/-) Current relative to output range, (+/-)	0.8 %
 Current, relative to output range, (+/-) Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference 	
Series mode interference (peak value of interference <	30 dB
rated value of input range), min.	00 dB
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
Interface types	
• RS 485	Yes
Output current of the interface, max.	200 mA
Protocols	Vee
MPI DROFIBLIS DR master	Yes
PROFIBUS DP master PROFIBUS DP slave	No No
PROFIBUS DP slave Point to point connection	No No
Point-to-point connection MPI	INU
Transmission rate, max.	187.5 kbit/s
Services	TOTAL NOTICE
— 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
Protocols	
PROFIsafe	No

PG/OP communication	Yes
Data record routing	No No
Global data communication	110
	Yes
supported Alumber of CD loops, may	8
Number of GD loops, max. Number of CD populate may	
Number of GD packets, max. Number of CD packets transmitter, max.	8
Number of GD packets, transmitter, max. Number of GD packets respires may.	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	
• 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, max.	7
reserved for OP communication	1
adjustable for OP communication, min.	
	1
— adjustable for OP communication, max.	7
usable for S7 basic communication	4
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	4
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 status variables, max. of which control variables, max.	14
	17
Forcing	Vec
• Forcing	Yes
• Forcing, variables	Inputs, outputs
Number of variables, max.	10
Diagnostic buffer	
present	Yes
Number of entries, max.	500
	500 No

Number of autilian and debte in DUN and	400
Number of entries readable in RUN, max.	499 Year From 10 to 400
— adjustable	Yes; From 10 to 499
— preset Service data	10
• can be read out	Yes
Interrupts/diagnostics/status information	103
Diagnostics indication LED	
Status indicator digital input (green)	Yes
Status indicator digital output (green)	Yes
Integrated Functions	
Frequency measurement	Yes
Number of frequency meters	3; up to 30 kHz (see "Technological 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	
Potential separation analog outputs	Yes; common for analog I/O
between the channels	No
between the channels and backplane bus	Yes
Isolation	999.1/100
Isolation tested with	600 V DC
Ambient conditions	
Ambient temperature during operation	0.00
• min.	0 °C
• max.	80 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
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	

User program protection/password protection	Yes
Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	660 g

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