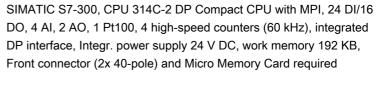
SIEMENS

Data sheet

6ES7314-6CH04-0AB0





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 DC	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines	Miniature circuit breaker, type C; min. 2 A; miniature circuit
(recommendation)	breaker type B, min. 4 A
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
• Repeat rate, min.	1 s
Load voltage L+	
Digital inputs	
— Rated value (DC)	24 V

Reverse polarity protection	Yes
	100
Digital outputs	24 V
— Rated value (DC)	
 Reverse polarity protection 	No
Input current	
Current consumption (rated value)	880 mA
Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	5 A
l²t	0.7 A ² ·s
Digital inputs	
• from load voltage L+ (without load), max.	80 mA
Digital outputs	
• from load voltage L+, max.	50 mA
Power loss	
Power loss, typ.	13 W
Memory Work memory	
Work memory	192 kbyte
• integrated	No
• expandable	
 Size of retentive memory for retentive data blocks 	64 kbyte
Load memory	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
 Data management on MMC (after last 	10 y
programming), min.	
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.06 µs
for word operations, typ.	0.12 µs
for fixed point arithmetic, typ.	0.16 µs
for floating point arithmetic, typ.	0.59 µs
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks
DD	can be reduced by the MMC used.
DB Newsbare was	1.024: Number range: 1 to 16000
• 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	
ОВ		
Description	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 DPV1 alarm OBs	3; OB 55, 56, 57	
Number of startup OBs	1; OB 100	
 Number of asynchronous error OBs 	5; OB 80, 82, 85, 86, 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		

Countary timers and their retentivity		
Counters, timers and their retentivity S7 counter		
• Number	256	
Retentivity		
— adjustable	Yes	
— lower limit	0	
— upper limit	255	
— preset	Z 0 to Z 7	
Counting range		
— lower limit	0	
— upper limit	999	
IEC counter		
Number	Unlimited (limited only by RAM capacity)	
S7 times		
• Number	256	
Retentivity		
— adjustable	Yes	
— lower limit	0	
— upper limit	255	
— preset	No retentivity	
Time range		

— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	411
retentive data area in total	All, max. 64 KB
Flag	050 h. 4.
Number, max.	256 byte
Retentivity available	Yes; MB 0 to MB 255
Retentivity preset	MB 0 to MB 15
Number of clock memories	8; 1 memory byte
Data blocks	
 Retentivity adjustable 	Yes; via non-retain property on DB
Retentivity preset	Yes
Local data	
per priority class, max.	32 kbyte; Max. 2048 bytes per block
Address area	
I/O address area	
• Inputs	2 048 byte
Outputs	2 048 byte
of which distributed	
— Inputs	2 003 byte
— Outputs	2 010 byte
Process image	
• Inputs	2 048 byte
Outputs	2 048 byte
• Inputs, adjustable	2 048 byte
Outputs, adjustable	2 048 byte
• Inputs, default	128 byte
Outputs, default	128 byte
Default addresses of the integrated channels	
— Digital inputs	124.0 to 126.7
— Digital outputs	124.0 to 125.7
— Analog inputs	752 to 761
— Analog outputs	752 to 755
Digital channels	
• Inputs	16 048
— of which central	1 016
Outputs	16 096
•	

Analog channels	— of which central	1 008
Outputs 1007 — of which central 250 Hardware configuration Number of Expansion units, max. 3 Number of DP masters • integrated • via CP • FM • CP, PIP • CP, LAN • Racks, max. • Modules per rack, max. • Modules per rack, max. • Modules per rack, max. • Modules per rack of the clock following POWER-ON • Eshavior of the clock following expiry of backup period • Seange of values • Range	Analog channels	
Outputs Of which central Of which centr	• Inputs	1 006
- of which central 250 Hardware configuration Number of expansion units, max. 3 Number of DP masters • integrated 1 • via CP 4 Number of operable FMs and CPs (recommended) • FM 8 • CP, PtP 8 • CP, LAN 10 Rack • Racks, max. 4 • Modules per rack, max. 8; In rack 3 max. 7 Time of day Clock • Hardware clock (real-time) Yes • telentive and synchronizable 6 wk, At 40 °C ambient temperature 1 os; Typ.: 2 s • Behavior of the clock following POWER-ON 6 Behavior of the clock following expiry of backup period Operating hours counter • Number 1 • Number 9 • Range of values 0 to 2^31 hours (when using SFC 101) • retentive 1 ves Wes 1 ves What 2 ves Wha	— of which central	253
Number of expansion units, max. Number of expansion units, max. Number of DP masters integrated ivia CP Number of operable FMs and CPs (recommended) FM CP, PtP 8 CP, LAN 10 Rack Racks, max. Modules per rack, max. Modules per rack, max. Sin rack 3 max. 7 Time of day Clock Hardware clock (real-time) retentive and synchronizable Beakup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Range of values Range of values Reacks Wes Raves Ra	Outputs	1 007
Number of DP masters • integrated	— of which central	250
Number of DP masters • integrated		
Number of DP masters integrated via CP A Number of operable FMs and CPs (recommended) FM FM CP, PtP 8 CP, LAN 10 Rack Racks, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. Kender of day Clock Hardware clock (real-time) retentive and synchronizable Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Number Range of values Range of walues Range of values Range of v		2
integrated via CP Number of operable FMs and CPs (recommended) FM CP, PM B CP, LAN 10 Rack Racks, max. Modules per rack, max. Modules per rack, max. Firme of day Clock Hardware clock (real-time) Pertentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Range of values Range of values Pertentive Person Pertentive Pe		
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Number of operable FMs and CPs (recommended) FM CP, PtP CP, LAN 10 Rack Racks, max. Modules per rack, max. Modules per rack, max. Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred PNumber Number Range of values Range of values Pres Total Muster Poes Poes Poes Poes Poes Poes Poes Poes		
FIM CP, PtP CP, LAN CP, LAN CP, LAN CP, LAN CP, LAN CP, LAN CRack Racks, max. Modules per rack, max. Modules per rack max. Modules per rack max. Modules per rack max. Modules per ra		,
CP, PtP CP, LAN CP, L		0
Clock Packs, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. Prime of day Clock Hardware clock (real-time) Pretentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Number Number Number 1 Number/Number range Range of values Pretentive Other is marked at each restart Clock synchronization Supported Nesser Nesee Nesser Nesser Nesser Nesser Nesser Nesser Nesser Nesser Nesser		
Rack Racks, max. Modules per rack, max. Modules per rack, max. Modules per rack, max. Image: Rack 3 max. 7 Time of day Clock Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number Number 1 Number/Number 1 Number/Number range Range of values O to 2^31 hours (when using SFC 101) retentive Ves; Must be restarted at each restart Clock synchronization supported Yes to MPI, master Yes to MPI, slave to DP, master		
Racks, max. Modules per rack, max. Modules per rack, max. Nodules per rack a max. 7 Nodules per rack, max. Nodules per rack, max. Nodules per rack, max. Nodules per rack, max. Nodules per rack a max. 7		10
Modules per rack, max. **S; In rack 3 max. 7 **Time of day** Clock **Hardware clock (real-time)** **retentive and synchronizable** **Backup time** **Deviation per day, max.** **Behavior of the clock following POWER-ON** **Behavior of the clock following expiry of backup period** **Operating hours counter** **Number**		1
Clock Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number Number 1 Number/Number range Range of values Page of values Tetentive Clock synchronization Synchronization Yes Ves To MPI, master Yes Yes Yes Yes Yes; With DP slave only slave clock		
Operating hours counter Number Number/Number range Range of values Pange of values Pange of values Supported Suppo	■ Modules per rack, max.	6, III fack 3 max. I
 Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number/Number range Range of values Testentive Ves; Must be restarted at each restart Clock synchronization supported to MPI, master to MPI, slave to DP, master Yes; With DP slave only slave clock	Time of day	
 retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number/Number range Range of values Range of values Testentive Yes; Must be restarted at each restart Clock synchronization supported to MPI, master to MPI, slave to DP, master Yes; With DP slave only slave clock	Clock	
Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Range of values Range of values retentive Clock synchronization Supported Suppor	Hardware clock (real-time)	Yes
 Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number/Number range Range of values Testentive Ves; Must be restarted at each restart Clock synchronization Yes to MPI, master to MPI, slave to DP, master Yes; With DP slave only slave clock	 retentive and synchronizable 	Yes
 Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number range Range of values Range of values Tetentive Yes; Must be restarted at each restart Clock synchronization Yes to MPI, master to MPI, slave to DP, master Yes; With DP slave only slave clock 	Backup time	6 wk; At 40 °C ambient temperature
Behavior of the clock following expiry of backup period Operating hours counter Number Number 1 Number/Number range 0 Range of values 0 to 2^31 hours (when using SFC 101) retentive Yes; Must be restarted at each restart Clock synchronization supported Yes to MPI, master to MPI, slave to DP, master Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred	 Deviation per day, max. 	10 s; Typ.: 2 s
period occurred Operating hours counter Number Number Number 1 Number/Number range Range of values Tetentive O to 2^31 hours (when using SFC 101) Yes; Must be restarted at each restart Clock synchronization Supported Yes To MPI, master To MPI, slave To MPI, slave To DP, master	 Behavior of the clock following POWER-ON 	Clock continues running after POWER OFF
Operating hours counter • Number • Number/Number range • Range of values • Range of values • retentive Clock synchronization • supported • to MPI, master • to MPI, slave • to DP, master O 1 1 0 0 0 0 0 0 0 0 0 0 0	Behavior of the clock following expiry of backup	Clock continues to run with the time at which the power failure
 Number Number/Number range Range of values retentive Clock synchronization supported to MPI, master to MPI, slave to DP, master Yes; With DP slave only slave clock 	period	occurred
 Number/Number range Range of values tetentive retentive Supported to MPI, master to MPI, slave to DP, master Number/Number range to DP, master Number (when using SFC 101) Yes; Must be restarted at each restart Yes; Must be restarted at each restart 	Operating hours counter	
 Range of values retentive Yes; Must be restarted at each restart Clock synchronization supported to MPI, master to MPI, slave to DP, master Yes Yes Yes Yes Yes Yes Yes	• Number	1
 retentive Yes; Must be restarted at each restart Clock synchronization supported to MPI, master to MPI, slave to DP, master Yes Yes; With DP slave only slave clock 	Number/Number range	0
Clock synchronization • supported Yes • to MPI, master Yes • to MPI, slave Yes • to DP, master Yes; With DP slave only slave clock	Range of values	0 to 2^31 hours (when using SFC 101)
 supported to MPI, master to MPI, slave to DP, master Yes 	• retentive	Yes; Must be restarted at each restart
 to MPI, master to MPI, slave to DP, master Yes Yes Yes Yes; With DP slave only slave clock 	Clock synchronization	
 to MPI, slave to DP, master Yes Yes; With DP slave only slave clock 	• supported	Yes
• to DP, master Yes; With DP slave only slave clock	• to MPI, master	Yes
	• to MPI, slave	Yes
● to DP, slave	• to DP, master	Yes; With DP slave only slave clock
,	• to DP, slave	Yes
• in AS, master Yes	• in AS, master	Yes
• in AS, slave	• in AS, slave	No
Digital inputs	Digital inputs	

Number of digital inputs	24	
	16	
 of which inputs usable for technological functions 	10	
integrated channels (DI)	24	
Input characteristic curve in accordance with IEC	Yes	
61131, type 1	100	
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 +30V	
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	
pa.a	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 counter/technological functions		
— at "0" to "1", max.	8 μs; Minimum pulse width/minimum pause between pulses at	
	maximum counting frequency	
Cable length		
• shielded, max.	1 000 m; 50 m for technological functions	
• unshielded, max.	600 m; For technological functions: No	
for technological functions		
— shielded, max.	50 m; at maximum count frequency	
— unshielded, max.	not allowed	
Digital outputs		
Number of digital outputs	16	
of which high-speed outputs	4; Notice: You cannot connect the fast outputs of your CPU in	
	parallel	
integrated channels (DO)	16	
Short-circuit protection	Yes; Clocked electronically	
 Response threshold, typ. 	1 A	
Limitation of inductive shutdown voltage to	L+ (-48 V)	
Controlling a digital input	Yes	

Switching capacity of the outputs	
● 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	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	
• 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.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	5
For voltage/current measurement	4
For resistance/resistance thermometer	1
measurement	
integrated channels (AI)	5; 4 x current/voltage, 1 x 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
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 $\Omega;$ 0 mA to 20 mA / 100 $\Omega;$ 4 mA to 20 mA / 100 Ω
 Resistance thermometer 	Yes; Pt 100 / 10 MΩ
Resistance	Yes; 0 Ω to 600 Ω / 10 $M\Omega$
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
Input resistance (0 to 10 V)	100 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Input resistance (0 to 20 mA)	100 Ω
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	100 Ω
• 4 mA to 20 mA	Yes
 Input resistance (4 mA to 20 mA) 	100 Ω
Input ranges (rated values), resistance thermometer	
● Pt 100	Yes
• Input resistance (Pt 100)	10 MΩ
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes
Input resistance (0 to 600 ohms)	10 MΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	No
Characteristic linearization	
parameterizable	Yes; by software
— for resistance thermometer	Pt 100
Cable length	
• shielded, max.	100 m
Analog outputs	
Number of analog outputs	2
integrated channels (AO)	2
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	55 mA

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

•	for inductive load	0.5 ms

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

Series mode interference (peak value of interference < rated value of input range), min.

Common mode interference, min.

40 dB

Number of industrial Ethernet interfaces

Number of PROFINET interfaces

Number of RS 485 interfaces

Number of RS 422 interfaces

1. Interface

Interface type

Integrated RS 485 interface

Integrated RS 485 interface

1. Interface		
Interface type	Integrated RS 485 interface	
Physics	RS 485	
Isolated	No	
Power supply to interface (15 to 30 V DC), max.	200 mA	
Functionality		
• MPI	Yes	
 PROFIBUS DP master 	No	
 PROFIBUS DP slave 	No	
 Point-to-point connection 	No	
MPI		
Transmission rate, max.	187.5 kbit/s	
Services		
— PG/OP communication	Yes	
— Routing	Yes	
 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	

2. Interface	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Functionality	
• MPI	No
 PROFINET IO Controller 	No
PROFINET IO Device	No
PROFINET CBA	No
 PROFIBUS DP master 	Yes
PROFIBUS DP slave	Yes
Point-to-point connection	No

DP master	
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	124
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
 S7 basic communication 	Yes; I blocks only
— S7 communication	Yes; Only server, configured on one side
— S7 communication, as client	No
 S7 communication, as server 	Yes
— Equidistance	Yes
— Isochronous mode	No
— SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes
 Number of DP slaves that can be simultaneously activated/deactivated, max. 	8
 Direct data exchange (slave-to-slave communication) 	Yes; As subscriber
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
DP slave	
● GSD file	The latest GSD file is available on the Internet (http://www.siemens.com/profibus-gsd)
Transmission rate, max.	12 Mbit/s
automatic baud rate search	Yes; only with passive interface
 Address area, max. 	32
 User data per address area, max. 	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
 Global data communication 	No
— S7 basic communication	No
— S7 communication	Yes; Only server, configured on one side
 S7 communication, as client 	No
 S7 communication, as server 	Yes

	 — Direct data exchange (slave-to-slave communication) 	Yes
Transfer memory Inputs Outputs Output		No
Inputs		1,0
Communication functions PG/OP communication Data record routing Global data communication * supported * Number of GD loops, max. * Number of GD packets, max. * Number of GD packets, transmitter, max. * Size of GD packets, receiver, max. * Size of GD packets, max. * Size		244 hyte
PG/OP communication PG/OP communication PG/OP communication Pes Bata record routing Pes Global data communication Pes Supported Number of GD loops, max. Number of GD packets, max. Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max. Size of GD packets, max. Size of GD packets	·	
PG/OP communication Pata record routing Global data communication * supported Number of GD loops, max. Number of GD packets, max. Number of GD packets, rransmitter, max. Number of GD packets, receiver, max. Number of GD packets, receiver, max. Size of GD packets, receiver, max. Size of GD packets, max. Pata of the packets o	— Outputs	211 Byte
Data record routing Global data communication • supported • Number of GD loops, max. • Number of GD packets, max. • Number of GD packets, transmitter, max. • Number of GD packets, transmitter, max. • Number of GD packets, transmitter, max. • Number of GD packets, receiver, max. • Size of GD packets, max. • Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported • as server • as client • User data per job, max. • User data per job (of which consistent), max. S8 compatible communication • supported • Syes; Via CP and loadable FB • User data per job (of which consistent), max. S8 compatible communication • supported • ves; Via CP and loadable FC Number of connections • overall • usable for PG communication — reserved for PG communication, min. — adjustable for PG communication, min. • usable for OP communication — reserved for OP communication — adjustable for OP communication — reserved for OP communication — adjustable for OP communication — adjustable for OP communication — adjustable for OP communication, min.		
Global data communication supported Number of GD loops, max. Number of GD packets, max. Number of GD packets, transmitter, max. Number of GD packets, transmitter, max. Number of GD packets, transmitter, max. Size of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max. Size of GD packets, receiver, ax. Size of GD packet of Size of		
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Number of GD packets, receiver, max. Size of GD packets, max. Size of GD packet (of which consistent), max. Size of GD packet (of which consistent), max. Solution of Spackets, max. Size of GD packet (of which consistent), max. Solution of Spackets, max. Supported Support	 Number of GD packets, max. 	8
Size of GD packets, max. Size of GD packet (of which consistent), max. Size of GD packet (of which consistent), max. Supported Suppor	 Number of GD packets, transmitter, max. 	8
Size of GD packet (of which consistent), max. S7 basic communication • supported • User data per job, max. • User data per job (of which consistent), max. S7 communication • supported • User data per job (of which consistent), max. Fyes • supported • Syes; Via CP and loadable FB • User data per job (of which consistent), max. • User data per job (of which consistent), max. • User data per job (of which consistent), max. S5 compatible communication • supported • supported • ves; via CP and loadable FC Number of connections • overall • usable for PG communication — adjustable for PG communication — adjustable for PG communication — adjustable for PG communication — reserved for OP communication — adjustable for OP communication, min. 11	 Number of GD packets, receiver, max. 	8
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Supported User data per job, max. User data per job (of which consistent), max. User data per job (of which consistent), max. User data per job (of which consistent), max. So communication Supported Yes As server As client User data per job, max. User data per job (of which consistent), max. User data per job (of which consistent), max. So compatible communication Supported Yes; via CP and loadable FB User data per job (of which consistent), max. Stompatible communication Supported Yes; via CP and loadable FC Number of connections overall usable for PG communication — adjustable for PG communication, min. — adjustable for PG communication, min. usable for OP communication usable for OP communication — adjustable for OP communication, min.	 Size of GD packet (of which consistent), max. 	22 byte
User data per job, max. User data per job (of which consistent), max. To byte To byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server) Sommunication Supported Supported Supported Super data per job, max. User data per job, max. User data per job (of which consistent), max. Supported Supported Yes; Via CP and loadable FB User data per job (of which consistent), max. User data per job (of which consistent), max. Supported Yes; via CP and loadable FC Number of connections Overall Supported Preserved for PG communication adjustable for PG communication, min. adjustable for PG communication Treserved for PG communication usable for OP communication adjustable for OP communication, min.	S7 basic communication	
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— adjustable for OP communication, max.	 reserved for OP communication 	1
	 adjustable for OP communication, min. 	1
• usable for S7 basic communication 8	 adjustable for OP communication, max. 	11
	• usable for S7 basic communication	8

reserved for S7 basic communication adjustable for S7 basic communication, min adjustable for S7 basic communication, max. • usable for routing S7 message functions Number of login stations for message functions, max. 12; Depending on the configured connections for PG/OP and S7 basic communication Process diagnostic messages Yes simultaneously active Alarm-S blocks, max. Test commissioning functions Status block Yes; Up to 2 simultaneously Single step Yes Number of breakpoints Status/control • Status/control variable Variables Number of variables, max of which status variables, max of which status variables, max of which control variables, max of which status variables, max of which control variables, max of which control variables, max of which control variables, max of which status variables, max of which control variables, max of which contr		
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Service data		
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Interru	nte/diac	incetice	/etatile	: into	ormation
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Status indicator digital input (green)Status indicator digital output (green)Yes

Integrated Functions

Number of counters 4; See "Technological Functions" manual

Counting frequency (counter) max.	60 kHz
Frequency measurement	Yes
Number of frequency meters	4; up to 60 kHz (see "Technological Functions" manual)
controlled positioning	Yes
integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)
PID controller	Yes
Number of pulse outputs	4; 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
Permissible potential difference	
between different circuits	75 V DC/60 V AC
Between the inputs and MANA (UCM)	8 V DC
between MANA and M internally (UISO)	75 V DC/60 V AC
Isolation	
Isolation tested with	600 V DC
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Configuration	
Configuration software	
• STEP 7	Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203

• STEP 7 Lite	No	
Programming		
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.	680 g	
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