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Data sheet 6ES7314-5AE83-0AB0

*** SPARE PART*** SIMATIC S7-300, CPU 314 IFM COMPACT CPU WITH MPI, FOR EXPANDED TEMPERATURE RANGE, 16DI/16DO, 4AI/1AO, 2 X 40 PIN, INTEGRATED 24V DC POWER SUPPLY, 32 KBYTE WORKING MEMORY

Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Load voltage L+	
• Rated value (DC)	24 V
• permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption (rated value)	1 000 mA
Inrush current, typ.	8 A
Power loss	
Power loss, typ.	16 W
Memory	
Work memory	
• integrated	32 kbyte; 32 KB/10 K instructions RAM (integrated); 1 instruction means 3 bytes on average
Load memory	
• integrated RAM, max.	48 kbyte
Backup	
• with battery	Yes; all blocks
• without battery	Yes; 144 bytes: Bit memories, counters, timers and data
CPU processing times	
for bit operations, typ.	0.3 µs
for bit operations, max.	0.6 µs
for word operations, typ.	1 µs
for fixed point arithmetic, typ.	2 µs
for floating point arithmetic, typ.	50 µs
for timer/counter operations, typ.	12 µs
CPU-blocks	
DB	
• Number, max.	127

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• Size, max.	8 kbyte
FB	
• Number, max.	128
• Size, max.	8 kbyte
FC	
• Number, max.	128
• Size, max.	8 kbyte
OB	
• Description	see instruction list
• Size, max.	8 kbyte
• Number of free cycle OBs	1; OB 1
• Number of time alarm OBs	1; OB 10
• Number of cyclic interrupt OBs	1; OB 35
• Number of process alarm OBs	1; OB 40
• Number of startup OBs	1; OB 100
Nesting depth	
• per priority class	8

Counters, timers and their retentivity	
S7 counter	
• Number	64
of which retentive with battery	
— can be set	Yes
— lower limit	0
— upper limit	63
of which retentive without battery	
— can be set	Yes
— lower limit	0
— upper limit	63
Counting range	
— lower limit	1
— upper limit	999
S7 times	
• Number	128
of which retentive with battery	
— adjustable	Yes
— lower limit	0
— upper limit	71
of which retentive without battery	
— adjustable	Yes
— lower limit	0
— upper limit	71

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Time range	
— lower limit	10 ms
— upper limit	9 990 s

Data areas and their retentivity	
Flag	
• Number, max.	256 byte
• Retentivity available	Yes; MB 0 to MB 255
• of which retentive with battery	0 to 2 047 (M 0.0 to M 255.7, adjustable)
• of which retentive without battery	0 to 1 152 (M 0.0 toM 143.7, adjustable)

Address area	
I/O address area	
• Inputs	512 byte
• Outputs	512 byte
Process image	
• Inputs	128 byte
• Outputs	128 byte
Digital channels	
• Inputs	992
• Outputs	992
Analog channels	
• Inputs	248
• Outputs	124
Addressing volume	
• Inputs	122 byte
• Outputs	122 byte
Address space per module	
• Address space per module, max.	512 byte; 512 byte / 512 byte

Hardware configuration	
Number of expansion units, max.	3
Number of modules per DP slave interface, max.	16
connectable programming devices/PCs	PGs/PCs with STEP 7 connectable via MPI interface
Number of DP masters	
• via CP	1; CP 342-5
Number of operable FMs and CPs (recommended)	
• FM	4
• CP, point-to-point	2
• CP, LAN	1
Rack	
• Modules per rack, max.	31

Time of day

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Clock	
• Hardware clock (real-time clock)	Yes
Digital inputs	
Number of digital inputs	20; of which 4 channels can be used for process alarms or integrated functions
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.	7 mA; Min. 2 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— at "0" to "1", max.	5 ms; typically 3 ms
for interrupt inputs	
— at "0" to "1", max.	50 µs
for counter/technological functions	
— at "0" to "1", max.	50 µs
Cable length	
• shielded, max.	1 000 m; 100 m for alarm and counter inputs
• unshielded, max.	600 m
Digital outputs	
Number of digital outputs	16
Short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	30 V
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" permissible range for 0 to 60 °C, max.	500 mA
• for signal "1" minimum load current	5 mA
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
Total current of the outputs (per group)	
all mounting positions	
— up to 40 °C, max.	4 A
— up to 60 °C, max.	2 A
Cable length	
• shielded, max.	1 000 m

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• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	4
Input ranges	
• Voltage	Yes
• Current	Yes
Input ranges (rated values), currents	
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	105.5 kΩ
Analog outputs	
Number of analog outputs	1
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• -20 mA to +20 mA	Yes
Analog value generation	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	100 µs; for each output 400 µs, analog outputs 40 µs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area, (+/-)	0.9 %
• Current, relative to input area, (+/-)	0.9 %
• Voltage, relative to output area, (+/-)	0.9 %
• Current, relative to output area, (+/-)	0.9 %
Interfaces	
PROFIBUS DP	
• Number of stations per segment, max.	16
MPI	
• Cable length, max.	9 100 m; Distance between 2 neighboring nodes, max. - without repeaters: 50 m; with 2 repeaters: 1100 m; with 10 repeaters in series: 9100 m; via fiber optic cable: 23.8 km (with 16 star hubs or OLMs)
1. Interface	

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Functionality	
• MPI	Yes
MPI	
• Number of nodes, max.	32; 32 nodes on MPI bus; PG/PC, OP, additional S7-300/400, C7; per CPU max. 4 static and 4 dynamic connections
• Transmission rate, max.	187.5 kbit/s
Services	
— PG/OP communication	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes

Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
S7 basic communication	
• supported	Yes
S7 communication	
• supported	Yes
• as server	Yes
S5 compatible communication	
• supported	Yes; via loadable blocks
Standard communication (FMS)	
• supported	Yes; via loadable blocks
Number of connections	
• overall	
— of which dynamic	8
— of which static	4

Integrated Functions	
Number of counters	2; 1 counter with 4 inputs or 2 counters with 2 inputs and 2 direction-dependent comparators for each counter; counter frequency 10 kHz; 32 bit (incl. sign)
Counting frequency (counter) max.	10 kHz
Frequency measurement	Yes; 1 channel to max. 10 kHz; measurement times 0.1 s, 1 s, 10 s; meas. procedure: calculation of pulse number per meas. time
controlled positioning	Yes; 1 channel; position detection via a 24 V asymmetrical incremental encoder; 3 digital inputs are occupied by the encoder (track A, track B, reference point); simple evaluation of the counting pulses (10 kHz)
PID controller	Yes; PID closed-loop control function blocks: Continuous controller outputs, binary controller outputs, automatic/manual mode, setpoint limitation

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Potential separation	
Potential separation digital inputs	
• between the channels, in groups of	16; Special inputs in groups of 4, inputs in groups of 16
• between the channels and backplane bus	Yes
Potential separation digital outputs	
• between the channels, in groups of	8
• between the channels and backplane bus	Yes
Potential separation analog inputs	
• between the channels, in groups of	4
• between the channels and backplane bus	Yes
Potential separation analog outputs	
• between the channels, in groups of	1
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	60 °C
Configuration	
Configuration software	
• STEP 7	Yes; V5.0 SP1
Programming	
• Command set	Binary logic operations, bracketed operations, result allocation, saving, counting, loading, transferring, comparing, shifting, rotating, complementation, calling blocks, fixed point arithmetic, floating point arithmetic, jump functions
• Nesting levels	8
• Program processing	free cycle (OB 1), time-controlled (OB 35), clock-time controlled (OB 10), interrupt controlled (OB 40), startup (OB 100)
• Program organization	Linear, structured
• System functions (SFC)	Interrupt and error processing, copy data, clock functions, diagnostic functions, module parameterization, operating mode transitions
Programming language	
— SCL	Yes
— GRAPH	Yes
Software libraries	
— Process diagnostics	Yes
— Software controller	Yes; depending on the required memory space and the resulting execution time
Know-how protection	
• User program protection/password protection	Yes
Cycle time monitoring	

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• lower limit	1 ms
• upper limit	6 000 ms
• adjustable	Yes
• preset	150 ms

Dimensions	
Width	160 mm
Height	125 mm
Depth	130 mm

Weights	
Weight, approx.	900 g

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