SIEMENS

SIMATIC S7-300, CPU 317T-2 DP, CENTRAL PROCESSING UNIT FOR PLC AND TECHNOLOGY 512 KBYTE WORKING MEMORY, 1. INTERFACE MPI/DP 12MBIT/S 2. INTERFACE DP(DRIVE), INTEGRATED I/O FOR TECHNOLOGY FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY CARD MIN. 4MB NECESSARY

General information

Hardware product version	02
Firmware version	CPU: V2.1.0, integrated technology: V3.0.1
Engineering with	
• Programming package	STEP 7 V 5.2 SP1 or higher with HF1 and S7-Technology option package

Supply voltage

Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	No

Input current

Current consumption (in no-load operation), typ.	200 mA
Inrush current, typ.	2.5 A
I²t	1 A²·s

Power loss

Power loss, typ.	6 W

Memory

Work memory	
• integrated	512 kbyte
• expandable	No
Load memory	
• Plug-in (MMC)	Yes; min. 4 MB required
• Plug-in (MMC), max.	8 Mbyte
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
Battery	

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Backup battery	
• Backup time, max.	10 y; Data retention on the MMC (after last programming)

CPU processing times	
for bit operations, typ.	0.05 µs
for word operations, typ.	0.2 µs
for fixed point arithmetic, typ.	0.2 µs
for floating point arithmetic, typ.	1 µs

CPU-blocks	
DB	
• Number, max.	2 047; DB 0 reserved
• Size, max.	64 kbyte
FB	
• Number, max.	2 048; see instruction list
• Size, max.	64 kbyte
FC	
• Number, max.	2 048; see instruction list
• Size, max.	64 kbyte
OB	
• Number, max.	see instruction list
• Size, max.	64 kbyte
Nesting depth	
• per priority class	16
• additional within an error OB	4

Counters, timers and their retentivity	
S7 counter	
• Number	512
Retentivity	
— adjustable	Yes
— preset	Z 0 to Z 7
Counting range	
— can be set	Yes
— lower limit	0
— upper limit	999
IEC counter	
• Number	Unlimited (limited only by RAM capacity)
S7 times	
• Number	512
Retentivity	
— adjustable	Yes
— preset	No retentivity
Time range	

— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	2048 (DBs, FCs, FBs). The maximum number of loadable blocks can be reduced by the MMC that you use.
Flag	
• Number, max.	4 096 byte
• Retentivity available	Yes; From MB 0 to MB 4095
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
Data blocks	
• Number, max.	2 047; DB 0 reserved
• Size, max.	64 kbyte
• Retentivity adjustable	Yes
Local data	
• per priority class, max.	1 024 byte
Address area	
I/O address area	
• Inputs	8 kbyte
• Outputs	8 kbyte
of which distributed	
— Inputs	8 kbyte
— Outputs	8 kbyte
Process image	
• Inputs	256 byte
• Outputs	256 byte
Digital channels	
• Inputs	65 636
— of which central	256
• Outputs	65 636
— of which central	256
Analog channels	
• Inputs	4 096
— of which central	64
• Outputs	4 096
— of which central	64
Hardware configuration	

Number of DP masters	
• integrated	2
• via CP	2

Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	10

Rack	
• Racks, max.	1
• Modules per rack, max.	8

Time of day

Clock	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 s

Operating hours counter	
• Number	4
• Number/Number range	0 to 3
• Range of values	0 to 2^31 hours (when using SFC 101)
• Granularity	1 hour
• retentive	Yes; Must be restarted at each restart

Clock synchronization	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes

Digital inputs

Number of digital inputs	4
Functions	technological functions, e.g. reference point detection (BERO); digital inputs can also be used (with restrictions) in STEP 7 user program.
Input characteristic curve in accordance with IEC 61131, type 1	Yes

Number of simultaneously controllable inputs	
all mounting positions	
— up to 40 °C, max.	4
— up to 60 °C, max.	4

Input voltage	
• Rated value (DC)	24 V

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● for signal "0"	-3 to +5V
● for signal "1"	+15 to +30V
Input current	
● for signal "1", typ.	7 mA
Input delay (for rated value of input voltage)	
for counter/technological functions	
— at "0" to "1", max.	10 μs; Typical
— at "1" to "0", max.	10 μs; Typical
Cable length	
● shielded, max.	1 000 m
● unshielded, max.	600 m

Digital outputs	
Number of digital outputs	8
Functions	For technology functions, e.g. high-speed cam switch signals
Short-circuit protection	Yes
● Response threshold, typ.	1 A
Limitation of inductive shutdown voltage to	2L+ (-48 V)
Controlling a digital input	No
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 "0", max.	3 V
● for signal "1", min.	2L+ (-2,5 V)
Output current	
● for signal "1" rated value	0.5 A
● for signal "1" permissible range for 0 to 60 °C, min.	5 mA
● for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
● for signal "0" residual current, max.	0.3 mA
Parallel switching of two outputs	
● for uprating	No
● for redundant control of a load	No
Switching frequency	
● with resistive load, max.	100 Hz
● with inductive load, max.	0.2 Hz; According to IEC 60947-5-1, DC-13
● on lamp load, max.	100 Hz
Total current of the outputs (per group)	
horizontal installation	

— up to 40 °C, max.	4 A
— up to 60 °C, max.	3 mA
all other mounting positions	
— up to 40 °C, max.	3 mA
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

Encoder

Connectable encoders	
• 2-wire sensor	No

1. 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	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
MPI	
• Transmission rate, max.	12 Mbit/s
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	Yes; Via CP and loadable FB
— S7 communication, as server	Yes
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	No
— S7 communication	No
— Equidistance	Yes
— SYNC/FREEZE	Yes

— DPV1	Yes
Address area	
— Inputs, max.	244 kbyte
— Outputs, max.	244 kbyte
DP slave	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	No
• Address area, max.	32
• User data per address area, max.	32 byte
Services	
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	No
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte

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
• PROFIBUS DP master	Yes; DP(DRIVE)-Master
• PROFIBUS DP slave	No
• Point-to-point connection	No
DP master	
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32
Services	
— PG/OP communication	No
— Routing	No
— Global data communication	No
— S7 basic communication	No
— S7 communication	No
— Equidistance	Yes
— SYNC/FREEZE	No

— Activation/deactivation of DP slaves	No
— DPV1	No
Address area	
— Inputs, max.	244 kbyte
— Outputs, max.	244 kbyte

Communication functions

PG/OP communication	Yes
Global data communication	
• supported	Yes
• Number of GD loops, max.	8
• Number of GD packets, max.	8
• Number of GD packets, transmitter, max.	8
• Number of GD packets, receiver, max.	8
• Size of GD packets, max.	22 byte
• Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
• 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.	160 byte; as server
S5 compatible communication	
• supported	Yes; via CP and loadable FC
Number of connections	
• overall	32
• usable for PG communication	31
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	31
• usable for OP communication	31
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	31
• usable for S7 basic communication	30
— reserved for S7 basic communication	0

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— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	30

S7 message functions	
Number of login stations for message functions, max.	32; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	60

Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	2
Status/control	
• Status/control variable	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	30
— of which status variables, max.	30
— of which control variables, max.	14
Forcing	
• Forcing	Yes
• Forcing, variables	Inputs, outputs
• Number of variables, max.	10
Diagnostic buffer	
• present	Yes
• Number of entries, max.	100
— adjustable	No

Interrupts/diagnostics/status information	
Alarms	No
Diagnostic functions	No
Diagnostics indication LED	
• Status indicator digital input (green)	Yes
• Status indicator digital output (green)	Yes

Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes
Potential separation digital outputs	
• between the channels and backplane bus	Yes

Permissible potential difference	
between different circuits	75 V DC/60 V AC

Isolation	
Isolation tested with	500 V DC

Configuration	
Configuration software	
• STEP 7	Yes; V5.2 SP1 or higher and S7 Technology option package
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

Dimensions	
Width	160 mm
Height	125 mm
Depth	130 mm

Weights	
Weight, approx.	750 g
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