

\*\*\* SPARE PART\*\*\* SIMATIC S7-300, CPU 317T-2 DP, CENTRAL PROCESSING UNIT FOR PLC AND TECHNOLOGY 1024 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. 8 MB NECESSARY



General information	
Hardware product version	01
Firmware version	CPU: V2.7, integrated technology: V4.1.5
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.4 + SP5 (and higher) and Optional package S7-Technology V4.2
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	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+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>Reverse polarity protection</li> </ul>	24 V Yes
Digital outputs	
Load voltage L+	
— Rated value (DC)	24 V; (2L+)

— Reverse polarity protection

No; (2L+)

### Input current

Current consumption (in no-load operation), typ.	200 mA
Inrush current, typ.	2.5 A
$I^2t$	1 A <sup>2</sup> ·s

### Power loss

Power loss, typ.	6 W
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### Memory

<b>Work memory</b>	
• integrated	1 024 kbyte
• expandable	No
<b>Load memory</b>	
• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
• Data management on MMC (after last programming), min.	10 y
<b>Backup</b>	
• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data

### CPU processing times

for bit operations, typ.	0.05 μs
for bit operations, max.	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

Number of blocks (total)	2 048; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
<b>DB</b>	
• Number, max.	2 047; Number band: 1 to 2047
• Size, max.	64 kbyte
<b>FB</b>	
• Number, max.	2 048; Number range: 0 to 2047
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	2 048; Number range: 0 to 2047
• Size, max.	64 kbyte
<b>OB</b>	
• 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 isochronous mode OBs 1; OB 61
- Number of technology synchronous alarm OBs 1; OB 65
- 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

#### S7 counter

- Number 512; Number range: 0 to 511

#### Retentivity

- adjustable Yes
- preset 8

#### Counting range

- can be set Yes
- lower limit 0
- upper limit 999

#### IEC counter

- present Yes
- Type SFB
- Number Unlimited (limited only by RAM capacity)

#### S7 times

- Number 512; Number range: 0 to 511

#### of which retentive without battery

- adjustable Yes

#### 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	All DBs, max. 256 KB
<b>Flag</b>	
• 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
<b>Data blocks</b>	
• Number, max.	2 047; from DB 1 to DB 2047
• Size, max.	64 kbyte
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	1 024 byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	8 192 byte
• Outputs	8 192 byte
<b>of which distributed</b>	
— Inputs	8 192 byte
— Outputs	8 192 byte
<b>Process image</b>	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
• Inputs, default	256 byte
• Outputs, default	256 byte
<b>Default addresses of the integrated channels</b>	
— Digital inputs	66
— Digital outputs	66
<b>Subprocess images</b>	
• Number of subprocess images, max.	1
<b>Digital channels</b>	
• Inputs	65 536
— of which central	512
• Outputs	65 536
— of which central	512
<b>Analog channels</b>	
• Inputs	4 096
— of which central	64
• Outputs	4 096
— of which central	64

## Hardware configuration

Number of expansion units, max.	0
<b>Number of DP masters</b>	
<ul style="list-style-type: none"> <li>• integrated</li> </ul>	2; 1 DP and 1 DP (drive)
<ul style="list-style-type: none"> <li>• via CP</li> </ul>	2; for DP
<b>Number of operable FMs and CPs (recommended)</b>	
<ul style="list-style-type: none"> <li>• FM</li> </ul>	8
<ul style="list-style-type: none"> <li>• CP, PtP</li> </ul>	8
<ul style="list-style-type: none"> <li>• CP, LAN</li> </ul>	10
<b>Rack</b>	
<ul style="list-style-type: none"> <li>• Racks, max.</li> </ul>	1
<ul style="list-style-type: none"> <li>• Modules per rack, max.</li> </ul>	8

## Time of day

<b>Clock</b>	
<ul style="list-style-type: none"> <li>• Hardware clock (real-time)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• retentive and synchronizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Backup time</li> </ul>	6 wk; At 40 °C ambient temperature
<ul style="list-style-type: none"> <li>• Deviation per day, max.</li> </ul>	10 s
<b>Operating hours counter</b>	
<ul style="list-style-type: none"> <li>• Number</li> </ul>	4
<ul style="list-style-type: none"> <li>• Number/Number range</li> </ul>	0 to 3
<ul style="list-style-type: none"> <li>• Range of values</li> </ul>	0 to 2 <sup>31</sup> hours (when using SFC 101)
<ul style="list-style-type: none"> <li>• Granularity</li> </ul>	1 hour
<ul style="list-style-type: none"> <li>• retentive</li> </ul>	Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
<ul style="list-style-type: none"> <li>• supported</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• to MPI, master</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• to MPI, slave</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• to DP, master</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• to DP, slave</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• in AS, master</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• in AS, slave</li> </ul>	Yes

## Digital inputs

Number of digital inputs	4
<ul style="list-style-type: none"> <li>• of which inputs usable for technological functions</li> </ul>	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes
<b>Number of simultaneously controllable inputs</b>	
horizontal installation	
— up to 40 °C, max.	4

— up to 60 °C, max.	4
vertical installation	
— up to 40 °C, max.	4
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
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
Digital outputs	
Number of digital outputs	8
• of which high-speed 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	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; (2L+)
• for signal "1", min.	Rated voltage -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
<b>Total current of the outputs (per group)</b>	
<b>horizontal installation</b>	
— up to 40 °C, max.	4 A
— up to 60 °C, max.	3 A
<b>all other mounting positions</b>	
— up to 40 °C, max.	3 A
<b>Cable length</b>	
• shielded, max.	1 000 m
<b>Analog inputs</b>	
Number of analog inputs	0
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	No
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	0
Number of RS 485 interfaces	2
Number of RS 422 interfaces	0
<b>1. Interface</b>	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
<b>Functionality</b>	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
<b>MPI</b>	
• Number of connections	32
• Transmission rate, max.	12 Mbit/s
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes

— S7 communication	Yes
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes; Connection configured on one side only
<b>DP master</b>	
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	124
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	Yes; I blocks only
— S7 communication	Yes
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes; Connection configured on one side only
— Equidistance	Yes
— Isochronous mode	Yes; OB 61
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— DPV1	Yes
<b>Address area</b>	
— Inputs, max.	8 192 byte
— Outputs, max.	8 192 byte
<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
<b>DP slave</b>	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	No
• Address area, max.	32
• User data per address area, max.	32 byte
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— S7 communication, as client	No; but via CP and loadable FB
— S7 communication, as server	Yes; Connection configured on one side only
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No



<b>Transfer memory</b>	
— 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

<b>Functionality</b>	
• MPI	No
• PROFIBUS DP master	Yes; DP(DRIVE)-Master
• PROFIBUS DP slave	No
• Point-to-point connection	No

<b>DP master</b>	
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	64

<b>Services</b>	
— PG/OP communication	No
— Routing	No
— Global data communication	No
— S7 basic communication	No
— S7 communication	No
— Equidistance	Yes
— Isochronous mode	Yes
— SYNC/FREEZE	No
— Activation/deactivation of DP slaves	Yes
— DPV1	No

<b>Address area</b>	
— Inputs, max.	1 024 byte
— Outputs, max.	1 024 byte

<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte

<b>DP slave</b>	
• GSD file	<a href="http://www.ad.siemens.de/support">http://www.ad.siemens.de/support</a> in Product Support area
• Transmission rate, max.	12 Mbit/s

<b>Communication functions</b>	
PG/OP communication	Yes
<b>Global data communication</b>	
• 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
<b>S7 basic communication</b>	
• 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), 76 bytes (with X_PUT or X_GET as server)
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes; Via CP and loadable FB
• User data per job, max.	See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication)
<b>S5 compatible communication</b>	
• supported	Yes; via CP and loadable FC
<b>Number of connections</b>	
• 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
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	30
• usable for routing	8; additional
<b>S7 message functions</b>	
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
<b>Test commissioning functions</b>	
Status block	Yes

Single step	Yes
Number of breakpoints	2
<b>Status/control</b>	
• 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
<b>Forcing</b>	
• Forcing	Yes
• Forcing, variables	Inputs, outputs
• Number of variables, max.	10
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	100
— adjustable	No
<b>Interrupts/diagnostics/status information</b>	
Alarms	No
Diagnostic functions	No
<b>Diagnostics indication LED</b>	
• Status indicator digital input (green)	Yes
• Status indicator digital output (green)	Yes
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• between the channels and backplane bus	Yes
<b>Potential separation digital outputs</b>	
• between the channels and backplane bus	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC
<b>Isolation</b>	
Isolation tested with	500 V DC
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C
<b>Configuration</b>	
<b>Configuration software</b>	
• STEP 7	Yes
<b>Programming</b>	
• Command set	see instruction list

• Nesting levels	8
• System functions (SFC)	see instruction list
• System function blocks (SFB)	see instruction list
<b>Programming language</b>	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
<b>Cycle time monitoring</b>	
• lower limit	1 ms
• upper limit	6 000 ms
• adjustable	Yes
• preset	150 ms
<b>Dimensions</b>	
Width	160 mm
Height	125 mm
Depth	130 mm
<b>Weights</b>	
Weight, approx.	750 g
<b>last modified:</b>	03/23/2017