

\*\*\* SPARE PART\*\*\* SIMATIC S7-300 CPU 315-2 PN/DP, CENTRAL PROCESSING UNIT WITH 256 KBYTE WORKING MEMORY, 1. INTERFACE MPI/DP 12MBIT/S, 2. INTERFACE ETHERNET PROFINET, MICRO MEMORY CARD NECESSARY



Figure similar

General information	
Hardware product version	01
Firmware version	V2.6
Engineering with	
• Programming package	STEP 7 V5.4 SP2
Supply voltage	
Rated value (DC)	24 V
• 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.
Input current	
Current consumption (rated value)	650 mA
Current consumption (in no-load operation), typ.	100 mA
Inrush current, typ.	2.5 A
I <sup>2</sup> t	1 A <sup>2</sup> ·s

Power loss	
Power loss, typ.	3.5 W
Memory	
Work memory	
<ul style="list-style-type: none"> <li>integrated</li> </ul>	256 kbyte; For program and data
<ul style="list-style-type: none"> <li>expandable</li> </ul>	No
Load memory	
<ul style="list-style-type: none"> <li>Plug-in (MMC)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Plug-in (MMC), max.</li> </ul>	8 Mbyte
<ul style="list-style-type: none"> <li>Data management on MMC (after last programming), min.</li> </ul>	10 y
Backup	
<ul style="list-style-type: none"> <li>present</li> </ul>	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> <li>without battery</li> </ul>	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.1 $\mu$ s
for word operations, typ.	0.2 $\mu$ s
for fixed point arithmetic, typ.	2 $\mu$ s
for floating point arithmetic, typ.	3 $\mu$ s
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 023; Number band: 1 to 1023
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	16 kbyte
FB	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	16 kbyte
FC	
<ul style="list-style-type: none"> <li>Number, max.</li> </ul>	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	16 kbyte
OB	
<ul style="list-style-type: none"> <li>Size, max.</li> </ul>	16 kbyte
<ul style="list-style-type: none"> <li>Number of free cycle OBs</li> </ul>	1; OB 1
<ul style="list-style-type: none"> <li>Number of time alarm OBs</li> </ul>	1; OB 10
<ul style="list-style-type: none"> <li>Number of delay alarm OBs</li> </ul>	1; OB 20
<ul style="list-style-type: none"> <li>Number of cyclic interrupt OBs</li> </ul>	1; OB 35
<ul style="list-style-type: none"> <li>Number of process alarm OBs</li> </ul>	1; OB 40
<ul style="list-style-type: none"> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55, 56, 57
<ul style="list-style-type: none"> <li>Number of isochronous mode OBs</li> </ul>	1; OB 61
<ul style="list-style-type: none"> <li>Number of startup OBs</li> </ul>	1; OB 100

• Number of asynchronous error OBs	6; OB 80, 82, 83, 85, 86, 87
• Number of synchronous error OBs	2; OB 121, 122
<b>Nesting depth</b>	
• per priority class	8
• additional within an error OB	4
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	8
<b>Counting range</b>	
— can be set	Yes
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
retentive data area in total	All, 128 KB max.
<b>Flag</b>	
• Number, max.	2 048 byte
• Retentivity available	Yes; MB 0 to MB 2047
• Retentivity preset	MB 0 to MB 15

• Number of clock memories	8; 1 memory byte
<b>Data blocks</b>	
• Number, max.	1 023; Number band: 1 to 1023
• Size, max.	16 kbyte
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	1 024 byte; per block max. 510
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 kbyte
• Outputs	2 kbyte
of which distributed	
— Inputs	2 kbyte
— Outputs	2 kbyte
<b>Process image</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
• Inputs, adjustable	2 kbyte
• Outputs, adjustable	2 kbyte
• Inputs, default	128 byte
• Outputs, default	128 byte
<b>Subprocess images</b>	
• Number of subprocess images, max.	1
<b>Digital channels</b>	
• Inputs	16 384
— of which central	1 024
• Outputs	16 384
— of which central	1 024
<b>Analog channels</b>	
• Inputs	1 024
— of which central	256
• Outputs	1 024
— of which central	256
<b>Hardware configuration</b>	
Number of expansion units, max.	3
<b>Number of DP masters</b>	
• integrated	1
• via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	8

• CP, PtP	8
• CP, LAN	10
<b>Rack</b>	
• Racks, max.	4
• Modules per rack, max.	8
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Backup time	6 wk; At 40 °C ambient temperature
• Deviation per day, max.	10 s
<b>Operating hours counter</b>	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)
• Granularity	1 hour
• retentive	Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• to DP, master	Yes; With DP slave only slave clock
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
• on Ethernet via NTP	Yes; As client
<b>Digital inputs</b>	
integrated channels (DI)	0
<b>Digital outputs</b>	
integrated channels (DO)	0
<b>Analog inputs</b>	
integrated channels (AI)	0
<b>Analog outputs</b>	
integrated channels (AO)	0
<b>Interfaces</b>	
Number of industrial Ethernet interfaces	1
Number of RS 485 interfaces	1
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	16
• 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
— S7 communication, as server	Yes
<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
— S7 communication, as server	Yes
— Equidistance	Yes
— Isochronous mode	Yes; OB 61
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— DPV1	Yes
<b>Address area</b>	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
<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	Yes; only with passive interface
• Address area, max.	32; With max. 32 bytes each
<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
— S7 communication, as server	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte

## 2. Interface

Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
<b>Functionality</b>	
• MPI	No
• PROFINET IO Controller	Yes
• PROFINET IO Device	No
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Open IE communication	Yes
• Web server	Yes
• Point-to-point connection	No
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32

— Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
— Number of connectable IO Devices, max.	128
— Send cycles	1 ms
— Updating time	1 to 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data)
<b>Address area</b>	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
— User data consistency, max.	254 byte
<b>PROFINET CBA</b>	
• acyclic transmission	Yes
• cyclic transmission	Yes
<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); 64 bytes (with X_PUT or X_GET as server)
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes; via integrated PROFINET interface and loadable FB or 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>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	8
— Data length, max.	1 460 byte; with connection type 01H; 8192 bytes with connection type 11H



<ul style="list-style-type: none"> <li>• ISO-on-TCP (RFC1006) <ul style="list-style-type: none"> <li>— Number of connections, max.</li> <li>— Data length, max.</li> </ul> </li> <li>• UDP <ul style="list-style-type: none"> <li>— Number of connections, max.</li> <li>— Data length, max.</li> </ul> </li> </ul>	<p>Yes; via integrated PROFINET interface and loadable FBs</p> <p>8</p> <p>8 192 byte</p> <p>Yes; via integrated PROFINET interface and loadable FBs</p> <p>8</p> <p>1 472 byte</p>
<b>PROFINET CBA (at set setpoint communication load)</b>	
<ul style="list-style-type: none"> <li>• Setpoint for the CPU communication load</li> <li>• Number of remote interconnection partners</li> <li>• Number of functions, master/slave</li> <li>• Total of all master/slave connections</li> <li>• Data length of all incoming connections master/slave, max.</li> <li>• Data length of all outgoing connections master/slave, max.</li> <li>• Number of device-internal and PROFIBUS interconnections</li> <li>• Data length of device-internal und PROFIBUS interconnections, max.</li> <li>• Data length per connection, max.</li> </ul>	<p>50 %</p> <p>32</p> <p>30</p> <p>1 000</p> <p>4 000 byte</p> <p>4 000 byte</p> <p>500</p> <p>4 000 byte</p> <p>1 400 byte</p>
<b>Remote interconnections with acyclic transmission</b>	
<ul style="list-style-type: none"> <li>— Sampling frequency: Sampling time, min.</li> <li>— Number of incoming interconnections</li> <li>— Number of outgoing interconnections</li> <li>— Data length of all incoming interconnections, max.</li> <li>— Data length of all outgoing interconnections, max.</li> <li>— Data length per connection, max.</li> </ul>	<p>500 ms</p> <p>100</p> <p>100</p> <p>2 000 byte</p> <p>2 000 byte</p> <p>1 400 byte</p>
<b>Remote interconnections with cyclic transmission</b>	
<ul style="list-style-type: none"> <li>— Transmission frequency: Transmission interval, min.</li> <li>— Number of incoming interconnections</li> <li>— Number of outgoing interconnections</li> <li>— Data length of all incoming interconnections, max.</li> <li>— Data length of all outgoing interconnections, max.</li> <li>— Data length per connection, max.</li> </ul>	<p>10 ms</p> <p>200</p> <p>200</p> <p>2 000 byte</p> <p>2 000 byte</p> <p>450 byte</p>
<b>HMI variables via PROFINET (acyclic)</b>	
<ul style="list-style-type: none"> <li>— Number of stations that can log on for HMI variables (PN OPC/iMap)</li> <li>— HMI variable updating</li> </ul>	<p>3; 2x PN OPC/1x iMap</p> <p>500 ms</p>

— Number of HMI variables	200
— Data length of all HMI variables, max.	2 000 byte
<b>PROFIBUS proxy functionality</b>	
— supported	Yes
— Number of linked PROFIBUS devices	16
— Data length per connection, max.	240 byte; Slave-dependent
<b>Number of connections</b>	
• overall	16
• usable for PG communication	15; max.
— reserved for PG communication	1
— adjustable for PG communication, min.	1
— adjustable for PG communication, max.	15; 1 to 15
• usable for OP communication	15
— reserved for OP communication	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	15; 1 to 15
• usable for S7 basic communication	14
— reserved for S7 basic communication	0
— adjustable for S7 basic communication, min.	0
— adjustable for S7 basic communication, max.	14; 0 to 14
• usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.

### S7 message functions

Number of login stations for message functions, max.	16; Depending on the configured connections for PG/OP and S7 basic communication
Process diagnostic messages	Yes
simultaneously active Alarm-S blocks, max.	40

### Test commissioning functions

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.	500
— adjustable	No
— of which powerfail-proof	100

## Configuration

### Configuration software

- |          |                         |
|----------|-------------------------|
| • STEP 7 | Yes; V5.4 SP2 or higher |
|----------|-------------------------|

### 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	80 mm
Height	125 mm
Depth	130 mm

## Weights

Weight, approx.	460 g
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**last modified:** 03/23/2017