

SIMATIC S7-300, CPU 315-2DP CPU WITH MPI INTERFACE  
 INTEGRATED 24 V DC POWER SUPPLY 256 KBYTE WORKING  
 MEMORY 2. INTERFACE DP-MASTER/SLAVE MICRO MEMORY  
 CARD NECESSARY



General information	
Hardware product version	01
Firmware version	V3.3
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V5.5 + SP1 or higher or STEP7 V5.2 + SP1 or higher with HSP 218
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	Yes
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
external protection for power supply lines (recommendation)	2 A min.
Mains buffering	
<ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
<ul style="list-style-type: none"> <li>Repeat rate, min.</li> </ul>	1 s
Input current	
Current consumption (rated value)	850 mA

Current consumption (in no-load operation), typ.	150 mA
Inrush current, typ.	3.5 A
$I^2t$	1 A <sup>2</sup> ·s

### Power loss

Power loss, typ.	4.5 W
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### Memory

#### Work memory

• Integrated	256 kbyte
• expandable	No
• Size of retentive memory for retentive data blocks	128 kbyte

#### Load memory

• Plug-in (MMC)	Yes
• Plug-in (MMC), max.	8 Mbyte
• Data management on MMC (after last programming), min.	10 y

#### Backup

• present	Yes; Guaranteed by MMC (maintenance-free)
• without battery	Yes; Program and data

### CPU processing times

for bit operations, typ.	0.05 μs
for word operations, typ.	0.09 μs
for fixed point arithmetic, typ.	0.12 μs
for floating point arithmetic, typ.	0.45 μs

### CPU-blocks

Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
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#### DB

• 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

#### OB

• 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 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	256
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#### 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

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

#### S7 times

• Number	256
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#### Retentivity

— can be set	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

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.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Local data</b>	
• per priority class, max.	32 kbyte; Max. 2 KB per block
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>of which distributed</b>	
— Inputs	2 048 byte
— Outputs	2 048 byte
<b>Process image</b>	
• 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
<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, point-to-point	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 clock)	Yes
• retentive and synchronizable	Yes
• Deviation per day, max.	10 s; Typ.: 2 s
• Backup time	6 wk; At 40 °C ambient temperature
• Behavior of the clock following POWER-ON	Clock continues running after POWER OFF
• Behavior of the clock following expiry of backup period	Clock continues to run with the time at which the power failure occurred
<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	No
<b>Digital inputs</b>	
Number of digital inputs	0
<b>Digital outputs</b>	
Number of digital outputs	0
<b>Analog inputs</b>	
Number of analog inputs	0
<b>Analog outputs</b>	

Number of analog outputs	0
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## Interfaces

Number of RS 485 interfaces	2; MPI and PROFIBUS DP
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Number of RS 422 interfaces	0
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### Industrial Ethernet

<ul style="list-style-type: none"> <li>Number of industrial Ethernet interfaces</li> </ul>	0
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## 1. Interface

Interface type	Integrated RS 485 interface
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Physics	RS 485
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Isolated	No
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Power supply to interface (15 to 30 V DC), max.	200 mA
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### Functionality

<ul style="list-style-type: none"> <li>MPI</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>DP master</li> </ul>	No
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<ul style="list-style-type: none"> <li>DP slave</li> </ul>	No
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<ul style="list-style-type: none"> <li>Point-to-point connection</li> </ul>	No
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### MPI

<ul style="list-style-type: none"> <li>Transmission rate, max.</li> </ul>	187.5 kbit/s
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### Services

<ul style="list-style-type: none"> <li>PG/OP communication</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>Routing</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>Global data communication</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>S7 basic communication</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>S7 communication</li> </ul>	Yes; Only server, configured on one side
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<ul style="list-style-type: none"> <li>S7 communication, as client</li> </ul>	No
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<ul style="list-style-type: none"> <li>S7 communication, as server</li> </ul>	Yes
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## 2. Interface

Interface type	Integrated RS 485 interface
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Physics	RS 485
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Isolated	Yes
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Power supply to interface (15 to 30 V DC), max.	200 mA
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### Functionality

<ul style="list-style-type: none"> <li>MPI</li> </ul>	No
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<ul style="list-style-type: none"> <li>DP master</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>DP slave</li> </ul>	Yes
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<ul style="list-style-type: none"> <li>Point-to-point connection</li> </ul>	No
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### DP master

<ul style="list-style-type: none"> <li>Transmission rate, max.</li> </ul>	12 Mbit/s
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<ul style="list-style-type: none"> <li>Number of DP slaves, max.</li> </ul>	124; Per station
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### Services

<ul style="list-style-type: none"> <li>PG/OP communication</li> </ul>	Yes
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— 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 mode support	Yes
— Isochronous mode	Yes; OB 61
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Number of DP slaves that can be simultaneously activated/deactivated, max.	8
— DPV1	Yes
<b>Address area</b>	
— Inputs, max.	2 048 byte
— Outputs, max.	2 048 byte
<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
<b>DP slave</b>	
• GSD file	The latest GSD file is available at: <a href="http://www.siemens.com/profibus-gsd">http://www.siemens.com/profibus-gsd</a>
• 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
<b>Services</b>	
— 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
— DPV1	No
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte

### Isochronous mode

Isochronous operation (application synchronized up to terminal)	Yes
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> <li>• Number of GD loops, max.</li> <li>• Number of GD packets, max.</li> <li>• Number of GD packets, transmitter, max.</li> <li>• Number of GD packets, receiver, max.</li> <li>• Size of GD packets, max.</li> <li>• Size of GD packet (of which consistent), max.</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>8</li> <li>8</li> <li>8</li> <li>8</li> <li>22 byte</li> <li>22 byte</li> </ul>
<b>S7 basic communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> <li>• User data per job, max.</li> <li>• User data per job (of which consistent), max.</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>76 byte</li> <li>76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)</li> </ul>
<b>S7 communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> <li>• as server</li> <li>• as client</li> <li>• User data per job, max.</li> <li>• User data per job (of which consistent), max.</li> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>Yes; Via CP and loadable FB</li> <li>180 byte; With PUT/GET</li> <li>240 byte; as server</li> </ul>
<b>S5 compatible communication</b>	
<ul style="list-style-type: none"> <li>• supported</li> </ul>	Yes; via CP and loadable FC
<b>Number of connections</b>	
<ul style="list-style-type: none"> <li>• overall</li> <li>• usable for PG communication <ul style="list-style-type: none"> <li>— reserved for PG communication</li> <li>— adjustable for PG communication, min.</li> <li>— adjustable for PG communication, max.</li> </ul> </li> <li>• usable for OP communication <ul style="list-style-type: none"> <li>— reserved for OP communication</li> <li>— adjustable for OP communication, min.</li> <li>— adjustable for OP communication, max.</li> </ul> </li> <li>• usable for S7 basic communication <ul style="list-style-type: none"> <li>— reserved for S7 basic communication</li> <li>— adjustable for S7 basic communication, min.</li> <li>— adjustable for S7 basic communication, max.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>16</li> <li>15</li> <li>1</li> <li>1</li> <li>15</li> <li>15</li> <li>1</li> <li>1</li> <li>15</li> <li>12</li> <li>0</li> <li>0</li> <li>12</li> </ul>



## 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.	300

## Test commissioning functions

Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4

<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
— can be set	No
— of which powerfail-proof	100; Only the last 100 entries are retained
• Number of entries readable in RUN, max.	
— can be set	Yes; From 10 to 499
— preset	10

<b>Service data</b>	
• can be read out	Yes

## Ambient conditions

<b>Ambient temperature during operation</b>	
• min.	0 °C
• max.	60 °C

## Configuration

<b>Configuration software</b>	
• STEP 7	Yes; V5.2 SP1 or higher with HW update

<b>Programming</b>	
• 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	40 mm
Height	125 mm
Depth	130 mm

Weights	
Weight, approx.	290 g

**last modified:** 24.07.2015