

*** SPARE PART*** SIMATIC S7-300 CPU315F-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 USEABLE WITH SOFTWARE OPTION S7 DISTRIBUTED SAFETY V5.4 OR HIGHER



Figure similar

General information	
Hardware product version	01
Firmware version	V2.6
Engineering with	
<ul style="list-style-type: none"> Programming package 	STEP 7 V5.4 SP2 or higher, S7 Distributed Safety V5.4 or higher
Supply voltage	
Rated value (DC)	24 V
<ul style="list-style-type: none"> 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 ² t	1 A ² ·s

Power loss	
Power loss, typ.	3.5 W
Memory	
Work memory	
<ul style="list-style-type: none"> integrated 	256 kbyte; For program and data
<ul style="list-style-type: none"> expandable 	No
Load memory	
<ul style="list-style-type: none"> Plug-in (MMC) 	Yes
<ul style="list-style-type: none"> Plug-in (MMC), max. 	8 Mbyte
<ul style="list-style-type: none"> Data management on MMC (after last programming), min. 	10 y
<ul style="list-style-type: none"> expandable FEPROM 	can be plugged in as MMC
Backup	
<ul style="list-style-type: none"> present 	Yes; Guaranteed by MMC (maintenance-free)
<ul style="list-style-type: none"> without battery 	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.1 μ s
for bit operations, max.	0.1 μ s
for word operations, typ.	0.2 μ s
for fixed point arithmetic, typ.	2 μ s
for floating point arithmetic, typ.	3 μ 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"> Number, max. 	1 023; Number band: 1 to 1023
<ul style="list-style-type: none"> Size, max. 	16 kbyte
FB	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> Size, max. 	16 kbyte
FC	
<ul style="list-style-type: none"> Number, max. 	1 024; Number range: 0 to 2047
<ul style="list-style-type: none"> Size, max. 	16 kbyte
OB	
<ul style="list-style-type: none"> Size, max. 	16 kbyte
<ul style="list-style-type: none"> Number of free cycle OBs 	1; OB 1
<ul style="list-style-type: none"> Number of time alarm OBs 	1; OB 10
<ul style="list-style-type: none"> Number of delay alarm OBs 	1; OB 20
<ul style="list-style-type: none"> Number of cyclic interrupt OBs 	1; OB 35
<ul style="list-style-type: none"> Number of process alarm OBs 	1; OB 40
<ul style="list-style-type: none"> 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	6; OB 80, 82, 83, 85, 86, 87
• Number of synchronous error OBs	2; OB 121, 122
Nesting depth	
• per priority class	8
• additional within an error OB	4
Counters, timers and their retentivity	
S7 counter	
• Number	256
of which retentive without battery	
— can be set	Yes
— lower limit	0
— upper limit	255
— preset	8
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— 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	256
of which retentive without battery	
— adjustable	Yes
— lower limit	0
— upper limit	255
Retentivity	
— adjustable	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.
Flag	
• 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
Data blocks	
• Number, max.	1 023; From DB 1 to DB 1023
• Size, max.	16 kbyte
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
Local data	
• per priority class, max.	1 024 byte; per block max. 510
Address area	
I/O address area	
• Inputs	2 kbyte
• Outputs	2 kbyte
of which distributed	
— Inputs	2 kbyte
— Outputs	2 kbyte
Process image	
• Inputs	2 048 byte
• Outputs	2 048 byte
Digital channels	
• Inputs	16 384
— of which central	1 024; max.
• Outputs	16 384
— of which central	1 024; max.
Analog channels	
• Inputs	1 024
— of which central	256; max.
• Outputs	1 024
— of which central	256; max.
Hardware configuration	

Number of expansion units, max.	3
Number of DP masters	
• integrated	1
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	10
Rack	
• Racks, max.	4
• 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	1
• Number/Number range	0
• 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
• to DP, master	Yes; With DP slave only slave clock
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
Digital inputs	
integrated channels (DI)	0
Digital outputs	
integrated channels (DO)	0
Analog inputs	
integrated channels (AI)	0
Analog outputs	
integrated channels (AO)	0

Interfaces

Number of industrial Ethernet interfaces	1
Number of RS 485 interfaces	2
Number of RS 422 interfaces	0

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

• Number of connections	16
• 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	No
— 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	Yes
— 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

DP slave	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes; only with passive interface
• Address area, max.	32; With max. 32 bytes each
Services	
— Routing	Yes; Only with active interface
— Global data communication	No
— S7 basic communication	Yes
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
— Direct data exchange (slave-to-slave communication)	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte

2. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	0 mA
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Functionality	
• MPI	No
• PROFINET IO Controller	Yes
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
• Point-to-point connection	No
PROFINET IO Controller	
• Transmission rate, max.	100 Mbit/s
Services	
— 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
— Number of connectable IO Devices, max.	128
— 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)

Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
— User data consistency, max.	256 byte
PROFINET CBA	
• acyclic transmission	Yes
• cyclic transmission	Yes
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 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)
S5 compatible communication	
• supported	Yes; via CP and loadable FC
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	8
— Data length, max.	1 460 byte
PROFINET CBA (at set setpoint communication load)	
• Setpoint for the CPU communication load	50 %
• Number of remote interconnection partners	32
• Number of functions, master/slave	17
• Total of all master/slave connections	1 000
• Data length of all incoming connections master/slave, max.	4 000 byte

• Data length of all outgoing connections master/slave, max.	4 000 byte
• Number of device-internal and PROFIBUS interconnections	500
• Data length of device-internal und PROFIBUS interconnections, max.	4 000 byte
• Data length per connection, max.	1 400 byte
Remote interconnections with acyclic transmission	
— Sampling frequency: Sampling time, min.	500 ms
— Number of incoming interconnections	100
— Number of outgoing interconnections	100
— Data length of all incoming interconnections, max.	2 000 byte
— Data length of all outgoing interconnections, max.	2 000 byte
— Data length per connection, max.	1 400 byte
Remote interconnections with cyclic transmission	
— Transmission frequency: Transmission interval, min.	10 ms
— Number of incoming interconnections	200
— Number of outgoing interconnections	200
— Data length of all incoming interconnections, max.	2 000 byte
— Data length of all outgoing interconnections, max.	2 000 byte
— Data length per connection, max.	450 byte
HMI variables via PROFINET (acyclic)	
— Number of stations that can log on for HMI variables (PN OPC/iMap)	3; 2x PN OPC/1x iMap
— HMI variable updating	500 ms
— Number of HMI variables	200
— Data length of all HMI variables, max.	2 000 byte
PROFIBUS proxy functionality	
— supported	Yes
— Number of linked PROFIBUS devices	16
— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• 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
- adjustable for OP communication, min.
- adjustable for OP communication, max.
- usable for S7 basic communication
 - reserved for S7 basic communication
 - adjustable for S7 basic communication, min.
 - adjustable for S7 basic communication, max.
- usable for routing

1
 1
 15; 1 to 15
 14
 0
 0
 14; 0 to 14
 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

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

Configuration

Configuration software	
• STEP 7	Yes; V5.3 SP3 and higher + HW update

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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