Data sheet



SIPLUS S7-300 CPU 315F-2PN/DP -25...+60°C with conformal coating based on 6ES7315-2FJ14-0AB0 . Central processing unit with 512 KB work memory, 1st interface MPI/DP 12Mbit/ s, 2nd interface Ethernet PROFINET, with 2-port switch, Micro Memory Card required

General information	
Product function	
 Isochronous mode 	Yes; Via PROFIBUS DP or PROFINET interface
Engineering with	
Programming package	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
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	2 A min.
(recommendation)	
Mains buffering	
Mains/voltage failure stored energy time	5 ms
• Repeat rate, min.	1 s
Input current	
Current consumption (rated value)	750 mA
Current consumption (in no-load operation), typ.	150 mA

Inrush current, typ.	4 A
1 ² t	1 A²·s
Power loss	
Power loss, typ.	4.65 W
Memory	
Work memory	
• integrated	512 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.
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
ОВ	
• 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 	6; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO)
 Number of synchronous error OBs 	2; OB 121, 122
Nesting depth	
per priority class	16
 additional within an error OB 	4

counter	
• Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— lower limit	0
— upper limit	999
C counter	
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
times	
Number	256
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
C 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	0.0401
Number, max.	2 048 byte
Retentivity available	Yes; MB 0 to MB 2 047
 Retentivity preset 	MB 0 to MB 15
 Number of clock memories 	8; 1 memory byte
Data blocks	
 Retentivity adjustable 	Yes; via non-retain property on DB
 Retentivity preset 	Yes
Local data	
• per priority class, max.	32 768 byte; Max. 2048 bytes per block
Address area	
I/O address area	
• Inputs	2 048 byte
Outputs	2 048 byte
of which distributed	
— Inputs	2 048 byte
— Outputs	2 048 byte
Process image	
• 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
Subprocess images	
Number of subprocess images, max.	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
Digital channels	
• Inputs	16 384
— of which central	1 024
Outputs	16 384
— of which central	1 024
Analog channels	
• Inputs	1 024
— of which central	256
Outputs	1 024
— of which central	256
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	1



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• 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; Typ.: 2 s
 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
Operating hours counter	
Number	1
Number/Number range	0
Range of values	0 to 2^31 hours (when using SFC 101)
Granularity	1 h
• 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
• on Ethernet via NTP	Yes; As client
Digital inputs	
Number of digital inputs	0
Digital outputs	
Number of digital outputs	0
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	0



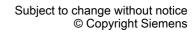
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Interfaces	
Number of industrial Ethernet interfaces	1
Number of PROFINET interfaces	1
Number of RS 485 interfaces	1
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA
Protocols	
• 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 	No; but via CP and loadable FB
— S7 communication, as server	Yes
PROFIBUS 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; I blocks only
— S7 communication	Yes
— S7 communication, as client	No
— S7 communication, as server	Yes
— Equidistance	Yes
Equidistance Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on
	PROFIBUS DP or PROFINET IO
— SYNC/FREEZE	Yes
 Activation/deactivation of DP slaves 	Yes



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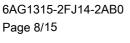


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N	0
 Number of DP slaves that can be simultaneously activated/deactivated, max. 	8
 — Direct data exchange (slave-to-slave communication) 	Yes; as subscriber
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
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
Services	·
— 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; Connection configured on one side only
Direct data exchange (slave-to-slave)	Yes
communication)	165
DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
·	·
2. Interface	PROFINIT
Interface type	PROFINET Ethernet RJ45
Physics Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
Interface types	
Number of ports	2
• integrated switch	Yes
Protocols	



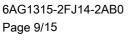
• MPI	No
PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality
PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
PROFIBUS DP master	No
PROFIBUS DP slave	No
Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	Yes; only read function
Media redundancy	Yes
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
— Isochronous mode	Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO
— IRT	Yes
— Shared device	Yes
— Prioritized startup	Yes
 Number of IO devices with prioritized 	32
startup, max.	
 Number of connectable IO Devices, max. 	128
— Of which IO devices with IRT, max.	64
— of which in line, max.	64
 Number of IO Devices with IRT and the option "high flexibility" 	128
— of which in line, max.	61
 Number of connectable IO Devices for RT, 	128
max.	
— of which in line, max.	128
 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
 — IO Devices changing during operation (partner ports), supported 	Yes
 Number of IO Devices per tool, max. 	8
— Device replacement without swap medium	Yes
— Send cycles	250 μs, 500 μs,1 ms; 2 ms, 4 ms (not in the case of IRT with "high



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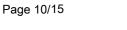
flexibility" option)

— Updating time	250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, technical Data" for more details)
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
— User data consistency, max.	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
 Shared device 	Yes
 Number of IO Controllers with shared device, max. 	2
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
 User data per submodule, max. 	1 024 byte
PROFINET CBA	
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	
Number of connections, max.	8
 Local port numbers used at the system end 	0, 20, 21, 25, 80, 102, 135, 161, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
 Keep-alive function, supported 	Yes
Protocols	
Redundancy mode	
Media redundancy	000 PROFINET MRR
— Switchover time on line break, typ.	200 ms; PROFINET MRP
— Number of stations in the ring, max.	50
Open IE communication	V
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
Number of connections, max.	8



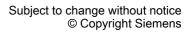


 Data length for connection type 01H, max. 	1 460 byte
 Data length for connection type 11H, max. 	32 768 byte
 — several passive connections per port, supported 	Yes
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 	8
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 	8
— Data length, max.	1 472 byte
Web server	
• supported	Yes; only read function
 User-defined websites 	Yes
 Number of HTTP clients 	5
Isochronous mode	
Isochronous mode Isochronous operation (application synchronized up	Yes; Via PROFIBUS DP or PROFINET interface
to terminal)	
Communication functions	
PG/OP communication	Yes
Data record routing	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	



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supported



Yes; via CP and loadable FC

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 	30
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 interval, 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



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Number of connections	
• overall	16
 usable for PG communication 	15
 reserved for PG communication 	1
 adjustable for PG communication, min. 	1
 adjustable for PG communication, max. 	15
 usable for OP communication 	15
 reserved for OP communication 	1
 adjustable for OP communication, min. 	1
 adjustable for OP communication, max. 	15
 usable for S7 basic communication 	14
 reserved for S7 basic communication 	0
 adjustable for S7 basic communication, 	0
min.	
 adjustable for S7 basic communication, 	14
max.	
usable for S7 communication	14
— reserved for S7 communication	0
 adjustable for S7 communication, min. 	0
 adjustable for S7 communication, max. 	14
• total number of instances, max.	32
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.	300
Fest commissioning functions	
Status block	Yes; Up to 2 simultaneously
Single step	Yes
Number of breakpoints	4
Status/control	
Status/control variable	Yes

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

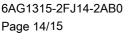


Diagnostic buffer	
• present	Yes
Number of entries, max.	500
— adjustable	No
of which powerfail-proof	100
Number of entries readable in RUN, max.	499
— adjustable	Yes
— preset	10
Service data	
• can be read out	Yes
- can be read out	1.00
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes; File E239877
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
• ATEX	Yes
Marine approval	
 American Bureau of Shipping (ABS) 	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
Installation altitude above sea level, max.	2 000 m
Ambient air temperature-barometric pressure-	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)
altitude	
Relative humidity	
With condensation, tested in accordance with	100 %; RH incl. condensation/frost (no commissioning under
IEC 60068-2-38, max.	condensation conditions)
Resistance	
Use in stationary industrial systems	
 to biologically active substances according to EN 60721-3-3 	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
 to chemically active substances according to EN 60721-3-3 	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
 to mechanically active substances according to EN 60721-3-3 	Yes; Class 3S4 incl. sand, dust, *
-	

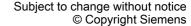


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Use on ships/at sea Yes; Class 6B2 mold and fungal spores (excluding fauna); Class - to biologically active substances according 6B3 on request to EN 60721-3-6 Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-- to chemically active substances according 52 (severity degree 3); * to EN 60721-3-6 Yes; Class 6S3 incl. sand, dust; * — to mechanically active substances according to EN 60721-3-6 Usage in industrial process technology - Against chemically active substances acc. Yes; Class 3 (excluding trichlorethylene) to EN 60654-4 Yes; Level GX group A/B (excluding trichlorethylene; harmful gas - Environmental conditions for process, concentrations up to the limits of EN 60721-3-3 class 3C4 measuring and control systems acc. to permissible); level LC3 (salt spray) and level LB3 (oil) ANSI/ISA-71.04 Remark * The supplied plug covers must remain in place over the unused - Note regarding classification of interfaces during operation! environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 Configuration Configuration software Yes; V5.5 or higher • STEP 7 Programming Command set see instruction list Nesting levels see instruction list System functions (SFC) see instruction list • System function blocks (SFB) Programming language — LAD Yes — FBD Yes - STL Yes -SCLYes Yes - CFC Yes - GRAPH Yes - HiGraph® Know-how protection • User program protection/password protection Yes; With S7 block Privacy • Block encryption Dimensions Width 40 mm Height 125 mm Depth 130 mm Weights



Weight, approx.



340 g

last modified: 10/09/2020

