SIEMENS

Data sheet

6ES7318-3FL01-0AB0



SIMATIC S7-300 CPU319F-3 PN/DP, Central processing unit with 2.5 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP master/slave 3rd interface Ethernet PROFINET, Micro Memory Card required

General information	
HW functional status	01
Firmware version	V3.2
Product function	
Isochronous mode	Yes; Via 2nd 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
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	
 Mains/voltage failure stored energy time 	5 ms
Repeat rate, min.	1 s
Input current	
Current consumption (rated value)	1 250 mA
Current consumption (in no-load operation), typ.	500 mA
Inrush current, typ.	4 A
l²t	1.2 A ² ·s
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
 integrated 	2 560 kbyte
expandable	No
Load memory	
• Plug-in (MMC)	Yes
 Plug-in (MMC), max. 	8 Mbyte
 Data management on MMC (after last programming), min. 	10 у
Backup	
present	Yes
without battery	Yes
CPU processing times	
for bit operations, typ.	0.004 µs
for word operations, typ.	0.01 µs
for fixed point arithmetic, typ.	0.01 µs

for floating point arithmetic, two	0.04 us
for floating point arithmetic, typ.	0.04 µs
CPU-blocks	
Number of blocks (total)	4 096; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	4 096; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
• Number, max.	4 096; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
Number, max.	4 096; Number range: 0 to 7999
• Size, max.	64 kbyte
OB	
• 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 (OB 35: smallest settable clock pulse = 500 $\mu s)$
 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
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
Counting range	
— adjustable	Yes
— lower limit	0
— upper limit	999
IEC counter	
• present	Yes
• Туре	SFB
Number	Unlimited (limited only by RAM capacity)
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	No retentivity
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
•Туре	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	700 kbyte

Flag	
• Size, max.	8 192 byte
Retentivity available	Yes; From MB 0 to MB 8 191
Retentivity available	MB 0 to MB 15
Number of clock memories	
Administration clock memories Data blocks	8; 1 memory byte
Retentivity adjustable	Yes; via non-retain property on DB
Retentivity adjustable	Yes
Local data	100
per priority class, max.	32 768 byte; Max. 2048 bytes per block
Address area	
I/O address area	
	8 102 hyto
InputsOutputs	8 192 byte 8 192 byte
of which distributed	0 192 Dyte
	9 102 hito
— Inputs	8 192 byte
- Outputs	8 192 byte
Process image	8 102 byte
Inputs Outputs	8 192 byte
Outputs	8 192 byte
Inputs, adjustable	8 192 byte
Outputs, adjustable	8 192 byte
Inputs, default	1 024 byte
Outputs, default	1 024 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	65 536
– of which central	1 024
Outputs	65 536
— of which central	1 024
Analog channels	
Inputs	4 096
— of which central	256
Outputs	4 096
— of which central	256
Hardware configuration	
Number of DP masters	
 integrated 	2
• 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	the clock continues at the time of day it had when power was switched
period	off
Operating hours counter	
Number	4
Number/Number range	0 to 3

Range of values	0 to 2^31 hours (when using SFC 101)
• Granularity	1h Martha and data a back and d
retentive	Yes; Must be restarted at each restart
Clock synchronization	Yes
 supported to MPI, master 	Yes
• to MPI, master	Yes
• to DP, master	
	Yes; With DP slave only slave clock Yes
 to DP, slave in AS, master 	Yes
• in AS, slave	Yes
In AS, slave on Ethernet via NTP	Yes; As client
Digital inputs	Tes, As client
	0
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
Interfaces	
Number of industrial Ethernet interfaces	1
Number of PROFINET interfaces	1
Number of RS 485 interfaces	2
Number of RS 422 interfaces	0
1. Interface	
Interface type	Integrated RS 485 interface
Isolated	Yes
Interface types	
• RS 485	Yes
 Output current of the interface, max. 	150 mA
Protocols	
• MPI	Yes
 PROFIBUS DP master 	Yes
 PROFIBUS DP slave 	Yes; A DP slave at both interfaces simultaneously is not possible
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
— Isochronous mode	No

	Vec
- SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
 — 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.	8 kbyte
— Outputs, max.	8 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. Services 	32 byte
	Vac
— PG/OP communication	Yes
— Routing	Yes; with interface active
— 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)	
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
Outputs 2. Interface	244 byte
	244 byte Integrated RS 485 interface
2. Interface	
2. Interface Interface type Isolated	Integrated RS 485 interface
2. Interface Interface type	Integrated RS 485 interface
2. Interface Interface type Isolated Interface types • RS 485	Integrated RS 485 interface Yes
2. Interface Interface type Isolated Interface types	Integrated RS 485 interface Yes Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max.	Integrated RS 485 interface Yes Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI	Integrated RS 485 interface Yes Yes 200 mA No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller	Integrated RS 485 interface Yes Yes 200 mA No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device	Integrated RS 485 interface Yes Yes 200 mA No No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA	Integrated RS 485 interface Yes Yes 200 mA No No No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave	Integrated RS 485 interface Yes Yes 200 mA No No No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication	Integrated RS 485 interface Yes Yes 200 mA No No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server	Integrated RS 485 interface Yes Yes 200 mA No No No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max.	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max.	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No 12 Mbit/s 124
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services — PG/OP communication	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing	Integrated RS 485 interface Yes Yes 200 mA No No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services — PG/OP communication	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing	Integrated RS 485 interface Yes Yes 200 mA No No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing - Global data communication	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes Yes No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing - Global data communication - S7 basic communication	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No No Yes; 12 Mbit/s 124
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing - Global data communication - S7 communication - S7 communication - S7 communication	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes; A DP slave at both interfaces simultaneously is not possible No No 12 Mbit/s 124 Yes Yes Yes Yes Yes Yes No No
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing - Global data communication - S7 communication - S7 communication, as client - S7 communication, as server	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes Yes; A DP slave at both interfaces simultaneously is not possible No No Yes; 12 Mbit/s 124
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing - Global data communication - S7 communication - S7 communication - S7 communication	Integrated RS 485 interface Yes Yes 200 mA No No No No No Yes; A DP slave at both interfaces simultaneously is not possible No No No 12 Mbit/s 124 Yes Yes Yes No Yes; I blocks only Yes; Connection configured on one side only Yes; Connection configured on one side only Yes
2. Interface Interface type Isolated Interface types • RS 485 • Output current of the interface, max. Protocols • MPI • PROFINET IO Controller • PROFINET TO Device • PROFINET CBA • PROFIBUS DP master • Open IE communication • Web server PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. Services - PG/OP communication - Routing - Global data communication - S7 communication - S7 communication, as client - S7 communication, as server - Equidistance	Integrated RS 485 interface Yes Yes 200 mA No No No No Yes; A DP slave at both interfaces simultaneously is not possible No No Yes; 4 DP slave at both interfaces simultaneously is not possible No No Yes; 1 blocks only Yes; 1 blocks only Yes; Connection configured on one side only

- SYNC/FREEZE	Vaa
 Activation/deactivation of DP slaves 	Yes
— Number of DP slaves that can be	Yes 8
simultaneously activated/deactivated, max.	0
— Direct data exchange (slave-to-slave	Yes; as subscriber
communication)	
— DPV1	Yes
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
PROFIBUS DP slave	
• GSD file	The latest GSD file is available at: http://www.siemens.com/profibus-gsd
 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; with interface active
— 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)	
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte
3. Interface	·
Interface type	PROFINET
Isolated	Yes
Isolated automatic detection of transmission rate	Yes Yes; 10/100 Mbit/s
Isolated automatic detection of transmission rate Autonegotiation	Yes Yes; 10/100 Mbit/s Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing	Yes Yes; 10/100 Mbit/s Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported	Yes Yes; 10/100 Mbit/s Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types	Yes Yes; 10/100 Mbit/s Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet)	Yes Yes; 10/100 Mbit/s Yes Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports	Yes Yes; 10/100 Mbit/s Yes Yes Yes 2
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch	Yes Yes; 10/100 Mbit/s Yes Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes 2 Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI	Yes Yes; 10/100 Mbit/s Yes Yes Yes 2 Yes No
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller	Yes Yes; 10/100 Mbit/s Yes Yes Yes 2 Yes No Yes; Also simultaneously with I-Device functionality
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes No No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes 2 Yes No No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No Yes; Via TCP/IP, ISO on TCP, and UDP
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes 2 Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes; No No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes 2 Yes No No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No Yes; Via TCP/IP, ISO on TCP, and UDP
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes 2 Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes; No No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes 2 Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes; No No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy PROFINET IO Controller	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max.	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes Yes No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services	Yes; 10/100 Mbit/s Yes Yes Yes Yes Yes Yes No No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes Yes
Isolated automatic detection of transmission rate Autonegotiation Autocrossing Change of IP address at runtime, supported Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET CBA • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication	Yes Yes; 10/100 Mbit/s Yes Yes Yes Yes Yes No No No Yes; Also simultaneously with I-Device functionality Yes; Also simultaneously with IO Controller functionality Yes; Also simultaneously with IO Controller functionality Yes No No Yes; Via TCP/IP, ISO on TCP, and UDP Yes Yes Yes

— Isochronous mode	Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously)
— Shared device	Yes
— Prioritized startup	Yes
 Number of IO devices with prioritized startup, max. 	32
- Number of connectable IO Devices, max.	256
- 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" 	256
— of which in line, max.	61
 — Number of connectable IO Devices for RT, max. 	256
— of which in line, max.	256
- 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 — Send cycles 	Yes 250 µs, 500 µs,1 ms; 2 ms, 4 ms (not in the case of IRT with "high
— Updating time	flexibility" option) 250 µs to 512 ms (depending on the operating mode, see Manual "S7-
Address area	300 CPU 31xC and CPU 31x, technical Data" for more details)
— Inputs, max.	8 kbyte
— Outputs, max.	8 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: 16, max. number of instances: 32
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFIenergy standard FB for I-Device
— Shared device	Yes
 — Number of IO Controllers with shared device, 	2
max. 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. 	32
 Local port numbers used at the system end 	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
Protocols	
PROFIsafe	Yes
Redundancy mode	
Media redundancy	
— Switchover time on line break, typ.	200 ms; PROFINET MRP
 Number of stations in the ring, max. 	50

	Open IE communication	
- Number of connections, max. - Data length for connection hyse 01H, max. - Solution of connection hyse 01H, max. - Data length for connections, max. - Data length, max. - Save of DB packets, transmitter, max. - Save of DB packets, transmitt		Ves: via integrated PROFINET interface and loadable EPs
Data length for connection type 01H, max. 278 byte Societtic PRF1NET interface and loadable FBs Number of connections, max. 22 Data length for connections, max. 22 Data length max. Ves, via integrated PROFINET interface and loadable FBs User-defined websites Ves, via integrated PROFINET interface and loadable FBs Ves Ve		-
- Data length for connection type 114, max. S2 768 byte - Number of connections, max. - Data length, max. - Number of connections, max. - Data length, max. - Data record numerication - Data record numerication - Vers. - Connunication - Data record numerication - Data record numerication - Data record numerication - Number of GD packets, max. - Number of GD packets, max. - So are Cord numerication - So are Cord numerication - So are Cord numerication - Data record numerication - Data record numerication - Data record numerication - So are Cord numerication - So are Cord packets, max. - So are Cord packets, max. - So are Cord packets, max. - So are Cord numerication - So are Cord packets, max. - So are Cord numerication - Data record numax - Data rec		
 ISO-on-TCP (RFC106) Yes: via integrated PROFINET Interface and loadable FBs - Data length, max. 22 768 byte UDP Yes: via integrated PROFINET Interface and loadable FBs - Data length, max. 22 768 byte - Data length, max. 22 768 byte - Data length, max. - Second functions / Fleador - Ves. - Second functions / Fleador - Second functions / Fleador - Second for GD postest, max. - Second for GD postest, max. - Second GD Poste		
 Number of connections, max. 22 By By Standard PROFINET Interface and loadable FBs UDP Number of connections, max. 23 - Date length, max. 472 by te Wets server Supported Ves Supported Ves PGOP communication functions / header PGOP communication functions, max. PGOP communication functions / header PGOP communication functions / header PGOP communication functions, max. Supported Ves PGOP communication functions / header PGOP communication functions / header Supported Ves Stee of GD packets, max. Stee of GD packets, receiver, max. Stee of GD packets, max. Ves Stee of		
- Data length, max. Yas, via integraned PROFINET interface and loadable FBs - Joat length, max. - Data length of all outgoing interconnections, - Data length of all outgoing interco		-
 UDP Ves, via integrated PROFINET interface and loadable FBs Number of connections, max. 32 Data length, max. 1472 byte User-defined websites Yes User-defined websites Yes Number of HTPP Glens 5 Communication functions / header PGOP communication Yes State record routing Yes Communication functions / header PGOP communication Yes Control of GD packets, max. 8 Number of GD packets, max. 8 Number of GD packets, max. 8 Number of GD packets, max. 8 Ster of GD packets, max. Ster of GD packets, max. 9 User data per job (of which consistent), max. 22 byte Ster of GD packets, max. 9 User data per job (of which consistent), max. 9 Ster of GD packets, max. 9 Ves integrated PROFINET interface and loadable FB or via CP and loadable FB User data per job (max. 75 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_RCV); 64 bytes		
 Number of connections, max. Data length, max. 1472 byte Web server supported Ves Number of HTTP clients Communication Finations PGOP communication Yes Data record routing Yes Clobal data communication Yes Statistic communication Yes Number of GD packets, max. 8 Number of GD packets, receiver, max. 8 Number of GD packets, treatment, max. Size of GD packet, treatment, max. Size of G	_	
→ Data length, max. 1472 byte Web server • • supported Yes • Number of HTPP clients 5 Communication functions / header Yes PGOP communication functions / header Yes • supported Yes • Supported Yes • Number of GD packets, transmitter, max. 8 • Number of GD packets, transmitter, max. 8 • Number of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 2 byte • Size of GD packets, transmitter, max. 7 byte • Size of GD packets, max. 2 byte • Size of GD packets, max. 2 byte • Size of GD packets, max. 7 byte • User data per job, (of which consistent), max. 7 byte • Size or GD packets, max.		-
Web server Yes • User-defined websites Yes • Number of HTTP clients 5 • Communication functions / bacter FG/OP communication PG/OP communication Yes • Supported Yes • Number of GD packets, max. 8 • Number of GD packets, transmitter, max. 8 • Number of GD packets, transmitter, max. 8 • Number of GD packets, transmitter, max. 8 • Size of GD packets, transmitter, max. 8 • Size of GD packets, transmitter, max. 22 byte • Size of GD packets, transmitter, max. 75 byte • User data per job, max. 76 byte • User data per job, max. 76 byte • supported Yes • as server Yes • as client Yes, via integrated PROFINET interface and loadable FB or via CP and loadable FB • Stoompatible communication Yes, via CP and loadable FB • supported Yes, via CP and loadable FC communication functions, PROFINET CBA (with set target communication load) / header • Stoompatible communication 20 •		
Supported Ves User-defined websites Yes User-defined websites Yes S S Communication functions / header PSOP communication S	-	1472 byte
• User-defined websites Yes • Number of HTTP clients 5 communication functions / Ibadar Yes PC/OP communication Yes • Supported Yes • Number of CDD packets, max. 8 • Number of CDD packets, max. 8 • Number of CDD packets, reasimiter, max. 8 • Number of CDD packets, reasimiter, max. 8 • Size of CD packets (f which consistent), max. 22 byte Size of CD packet (f which consistent), max. 22 byte Size of CD packet (f which consistent), max. 22 byte Size of CD packet (f which consistent), max. 76 byte • User data per job, max. 8 • User data per job, max. 8 • User data per job, max. 8 • User data per job, max. 9 • User data per job, max. 9 • User data per job, max. 9 • User data per job, max. 9 <		Vec
Number of HTTP clients Communication TeVCPC communication Ves Control of functions / header Ves Control of Contro		
communication Yes PCOP communication Yes Global data communication Yes • Number of GD loops, max. 8 • Number of GD packets, max. 8 • Size of GD packets, max. 22 byte • Size of GD packets, max. 76 byte • Size of GD packets, max. 76 byte • User data per job, max. 76 byte • User data per job (of which consistent), max. 76 byte • User data per job, max. 76 byte • Size of GD packet (of which consistent), max. 76 byte • User data per job, max. 76 byte • User data per job, max. 76 byte • supported Yes • as client Yes • as client Yes intergrated PROFINET interface and loadable FB • User data per job, max. See online help of STEP 7 (chared parameters of the SFBs/FBs and of the SFC/Cs of ST Communication • User data per job, max. See online help of STEP 7 (chared parameters of the SFBs/FBs and of the SFC/Cs of ST Communication) • State of fun		
PG/OP communication Yes Data record routing Yes Obtain record routing Yes • Supported Yes • Number of GD packets, max. 8 • Number of GD packets, receiver, max. 8 • Number of GD packets, receiver, max. 8 • Stize of GD packets, receiver, max. 8 • Size of GD packets, receiver, max. 22 byte • Size of GD packets, receiver, max. 22 byte • Size of GD packets, receiver, max. 22 byte • User data per job, max. 76 byte; • User data per job, max. 76 byte; • User data per job, max. 76 byte; • user off an per job, max. 76 byte; • user off at per job, max. 76 byte; • user off at per job, max. 76 byte; • user off at per job, max. 76 byte; • user off at per job, max. 8 • user off at per job, max. See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCS#CS of S7 Communication • user off incloins, matervisive 50 • otal of all master/slave 50 • Total of all master/slave connections 3000 • Data length of all outgoing connections master/slave, max. 24 000 byte • Data length of all outgoing connections masterinser, max. <td< td=""><td></td><td>5</td></td<>		5
Data record routing Yes Global data communication • • supported Yes • Number of GD packets, transmitter, max. 8 • Number of GD packets, treasmitter, max. 8 • Stize of GD packets, treasmitter, max. 8 • Stize of GD packets, treasmitter, max. 8 • Stize of GD packet (of which consistent), max. 22 byte Stize of GD packet (of which consistent), max. 22 byte Stize of GD packet (of which consistent), max. 76 byte • supported Yes • supported Yes • 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 SFC/FCs of S7 Communication) Stoompatible communication Yes, via integrated ormunication loadol / header • Supported Yes, via CP and loadable FC communication functions / PROFINET CBA (with set target communication load) / header • Supported fromotion, insater/slave, max. 24 000 byte • Number of functions, master/s		No.
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S5 compatible communication • supported Yes; via CP and loadable FC communication functions / PROFINET CBA (with set target communication load) / header • Setpoint for the CPU communication load 20 % • Number of remote interconnection partners 32 • Number of functions, master/slave 50 • Total of all master/slave connections 3 000 • Data length of all incoming connections 24 000 byte master/slave, max. 24 000 byte • Number of device-internal and PROFIBUS 1 000 interconnections, max. 1 400 byte • Data length of device-internal und PROFIBUS 1 000 interconnections, max. 1 400 byte • Data length per connection, max. 1 400 byte performance data / PROFINET CBA / remote interconnection / with acyclic transfer / header - Sampling interval, min. 200 ms - Number of incoming interconnections 100 - Number of outgoing interconnections 100 - Number of incoming interconnections 100 - Data length of all incoming interconnections, max. 200 ms - Number of outgoing interconnections, max. 100 - Data length of all incoming interconnectio	 User data per job, max. 	
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max. — Data length of all outgoing interconnections, 3 200 byte	 — Number of outgoing interconnections 	100
— Data length of all outgoing interconnections, 3 200 byte		3 200 byte
		3 200 byte

— Data length per connection, max.	1 400 byte
performance data / PROFINET CBA / remote interconnec	ction / with cyclic transfer / header
— Transmission frequency: Transmission interval,	1 ms
min.	200
— Number of incoming interconnections	300
— Number of outgoing interconnections	300 4 800 bute
 Data length of all incoming interconnections, max. 	4 800 byte
 — Data length of all outgoing interconnections, 	4 800 byte
max.	
 — Data length per connection, max. 	450 byte
performance data / PROFINET CBA / HMI variables via F	PROFINET / acyclic / header
 — 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 	600
 Data length of all HMI variables, max. 	9 600 byte
performance data / PROFINET CBA / PROFIBUS proxy f	functionality / header
— supported	Yes
 — Number of linked PROFIBUS devices 	32
— Data length per connection, max.	240 byte; Slave-dependent
Number of connections	
• 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 S7 communication 	16
- reserved for S7 communication	0
 — adjustable for S7 communication, min. 	0
 — adjustable for S7 communication, max. 	16
 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 DP master: max. 24; X2 as DP slave (active):
	max. 14; X3 as PROFINET: 48 max.
S7 message functions	
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.	300
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; From 10 to 499
— preset	10
Service data	
● can be read out	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0°0
• max.	60 °C
configuration / header	
Configuration software	
• STEP 7	Yes; V5.5 or higher
configuration / programming / header	
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	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	1 250 g
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