SIEMENS

Data sheet

6ES7318-3EL01-0AB0



SIMATIC S7-300 CPU 319-3 PN/DP, Central processing unit with 2 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP master/slave 3rd interface Ethernet PROFINET, with 2-port switch, 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
Supply voltage	
Rated value (DC)	
• 24 V DC	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	
	-
 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 A²·s
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
• integrated	2 048 kbyte
• expandable	No
 Size of retentive memory for retentive data blocks 	700 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
• 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, 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
ОВ	
• Size, max.	64 kbyte
 Number of free cycle OBs 	1; OB 1
 Number of time alarm OBs 	1; OB 10

4, 35 (OB 35: smallest settable clock pulse = 500
7
3, 85, 86, 87 (OB83 only for PROFINET IO)

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
• Type	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
• Type	SFB

Unlimited (limited only by RAM capacity	Unlimited	(limited onl	y by RAM	capacity
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• Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	all, max. 700 KB
Flag	
Number, max.	8 192 byte
 Retentivity available 	Yes; From MB 0 to MB 8 191
 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	8 192 byte
Outputs	8 192 byte
of which distributed	
— Inputs	8 192 byte
— Outputs	8 192 byte
Process image	
• Inputs	8 192 byte
Outputs	8 192 byte
 Inputs, adjustable 	8 192 byte
 Outputs, adjustable 	8 192 byte
 Inputs, default 	256 byte
 Outputs, default 	256 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	
	Yes
Hardware clock (real-time) retentive and synchronizable	Yes
retentive and synchronizableBackup time	6 wk; At 40 °C ambient temperature
·	10 s; Typ.: 2 s
Deviation per day, max. Deviation of the clock following POWER ON.	Clock continues running after POWER OFF
Behavior of the clock following POWER-ON	-
 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	4
Number/Number range	0 to 3
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
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; 2 ports (switch) RJ45
Number of PROFINET interfaces	1; 2 ports (switch) RJ45
Number of RS 485 interfaces	2; Combined MPI / PROFIBUS DP and PROFIBUS DP
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.	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
— SYNC/FREEZE	Yes
— STNO/I NELZE	100

 Activation/deactivation of DP slaves 	Yes
Number of DP slaves that can be	8
simultaneously activated/deactivated, max.	Ů
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	
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
2. 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	No
PROFINET IO Controller	No
PROFINET IO Device	No
PROFINET CBA	No
PROFIBUS DP master	Yes

Open IE communication Web server PROFIBUS DP master Transmission rate, max. Number of DP slaves, max. PG/OP communication Services PG/OP communication Routing Global data communication S7 communication, as client S7 communication, as client S7 communication, as server Equidistance Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) SYNC/FREEZE Activation/deactivation of DP slaves Number of DP slaves that can be simultaneously activated/deactivated, max. Direct data exchange (slave-to-slave communication) DPV1 Address area Inputs, max. Outputs, max. User data per DP slave Inputs, max. Outputs, max. S kbyte Ves GSD file Transmission rate, max. Address area, max. Ves; only with passive interface Address area, max. User data per address area, max. Address area, max. Ves; only with passive interface PG/OP communication Yes Ves; with interface active PGIODA data communication Yes Services PG/OP communication No	PROFIBUS DP slave	Yes; A DP slave at both interfaces simultaneously is not possible
Web server No		
PROFIBUS DP master • Transmission rate, max. • Number of DP slaves, max. • Number of DP slaves, max. PGI/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication — S7 communication — S7 communication, as client — S7 communication, as server — Equidistance — Isochronous mode — Isochronous mode — Isochronous mode — Yes; Os 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — SYNC/FREEZE — Activation/deactivation of DP slaves — Number of DP slaves that can be simultaneously activated/deactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 Address area — Inputs, max. — Outputs, base • GSD file Transmission rate, max. • automatic baud rate search • Address area, max. • User data per DP slave — PG/OP communication — Poutputs, max. • User data per DP slave — PG/OP communication — Poutputs, max. • User data per DP slave — PG/OP communi		
It is a block of the property		
Number of DP slaves, max. PG/OP communication Pounting Pounting Pounting Pounting Pounting Pounting Pounting Pounting Pountication Pounting Pountication Pounti		12 Mbit/s
Services		
Routing Yes Global data communication No S7 basic communication Yes; I blocks only Yes Communication Yes S7 communication Yes S7 communication, as client No S7 communication, as server Yes; Connection configured on one side only Yes Leguidistance Yes Connection configured on one side only Yes OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes Activation/deactivation of DP slaves Yes Number of DP slaves Hat can be simultaneously activated/deactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 Yes Address area — Inputs, max. — 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. • automatic baud rate search • Address area, max. • User data per address area, max. • Outputs, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per DP slave — Poi/OP communication No	·	,
- 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; Connection configured on one side only - Equidistance Yes - Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) - SYNC/FREEZE Yes - Activation/deactivation of DP slaves Yes - Number of DP slaves that can be simultaneously activated/deactivated, max. - Direct data exchange (slave-to-slave communication) Yes - Inputs, max. 8 kbyte User data per DP slave - Inputs, max. 244 byte - 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 • Address area, max. 32 byte Services - PG/OP communication Yes - Routing Yes; with interface active - Routing Y	— PG/OP communication	Yes
- Global data communication - S7 basic communication - S7 communication - S7 communication, as client - S7 communication, as client - S7 communication, as server - S7 communication, as server - Equidistance - Isochronous mode - Isochronous mode - Isochronous mode - SYNC/FREZE - Activation/deactivation of DP slaves - Number of DP slaves that can be simultaneously activated/deactivated, max Direct data exchange (slave-to-slave communication) - DPV1 - Address area - Inputs, max Outputs,		Yes
- S7 basic communication Yes; I blocks only - S7 communication Yes - S7 communication, as client No - S7 communication, as server Yes; Connection configured on one side only - Equidistance Yes - Isochronous mode Yes; OB 61 - Isochronous mode is possible either on DP or PROFINET IO (not simultaneously) - SYNC/FREEZE Yes - Activation/deactivation of DP slaves Yes - Number of DP slaves that can be simultaneously activated/deactivated, max Direct data exchange (slave-to-slave communication) - DPV1 Yes Address area - Inputs, max. 8 kbyte - Inputs, max. 8 kbyte - User data per DP slave - Inputs, max. 244 byte - User data per DP slave - GSD file The latest GSD file is available at: http://www.siemens.com/profibus-gsd - Transmission rate, max. 12 Mbit/s - Address area, max. 32 - User data per address area, max. 32 - User d	•	No
- S7 communication		Yes; I blocks only
— S7 communication, as client — S7 communication, as server — S7 communication, as server — Equidistance — Isochronous mode — Isochronous mode — Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — SYNC/FREEZE — Activation/deactivation of DP slaves — Number of DP slaves that can be simultaneously activated/deactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 — Yes Address area — Inputs, max. — 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. • automatic baud rate search • Address area, max. • automatic baud rate search • Address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • User data per address area, max. • Services — PG/OP communication — Routing — Global data communication No		
— S7 communication, as server — Equidistance — Isochronous mode — Isochronous mode — Isochronous mode — SYNC/FREEZE — Activation/deactivation of DP slaves — Number of DP slaves that can be simultaneously activated/deactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 — Syncy Res — Inputs, max. — Outputs, max. — Outputs, max. — User data per DP slave — Inputs, max. — Outputs, max. — Outputs, max. — Outputs, max. — 244 byte — PROFIBUS DP slave • GSD file — The latest GSD file is available at: — http://www.siemens.com/profibus-gsd — 1 Address area, max. — automatic baud rate search — Address area, max. — 4 Sys conjection configured on one side only — Yes — Routing — Global data communication — No		
- Equidistance - Isochronous mode - Isochronous mode - Isochronous mode - Isochronous mode - Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) - SYNC/FREEZE - Activation/deactivation of DP slaves - Number of DP slaves that can be simultaneously activated/deactivated, max Direct data exchange (slave-to-slave communication) - DPV1 - Yes - Inputs, max Outputs, max		
— Isochronous mode — Isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — SYNC/FREEZE — Activation/deactivation of DP slaves — Number of DP slaves that can be simultaneously activated/deactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 — Yes Address area — Inputs, max. — Outputs, max. — 1 Inputs, max. — Outputs, max. — Outputs, max. — 1 Inputs, max. — 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 • Address area, max. • User data per address area, max. 32 • User data per address area, max. Services — PG/OP communication — Routing — Global data communication No		
- SYNC/FREZE Yes - Activation/deactivation of DP slaves Yes - Number of DP slaves that can be simultaneously activated/deactivated, max Direct data exchange (slave-to-slave communication) - DPV1 Yes Address area - Inputs, 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 • User data per address area, max. 32 • User data per address area, max. 32 • PG/OP communication Yes - Routing Yes; with interface active - Routing Yes; with interface active - Global data communication	•	Yes; OB 61 - isochronous mode is possible either on DP or
— Number of DP slaves that can be simultaneously activated/ideactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 Yes Address area — Inputs, max. — Outputs, max. — Yes yet by the exception of the proof	— SYNC/FREEZE	
simultaneously activated/deactivated, max. — Direct data exchange (slave-to-slave communication) — DPV1 Yes Address area — Inputs, max. — Outputs, max. — Outputs, max. — Inputs, max. — Inputs, max. — Outputs, max. — Inputs, max. — Outputs, max. — O	 Activation/deactivation of DP slaves 	Yes
- Direct data exchange (slave-to-slave communication) - DPV1 Yes Address area - Inputs, max 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 • Address area, max. 32 • User data per address area, max. 32 byte Services - PG/OP communication - Routing - Global data communication No		8
Address area — Inputs, max. — 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 Address area, max. 32 • User data per address area, max. 32 byte Services — PG/OP communication — Routing — Global data communication No	— Direct data exchange (slave-to-slave	Yes; as subscriber
- Inputs, max 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 • Address area, max. 32 • User data per address area, max. 32 byte Services - PG/OP communication - Routing - Global data communication No	— DPV1	Yes
User data per DP slave — Inputs, max. — Outputs, max. — 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 • Address area, max. 32 • User data per address area, max. 32 byte Services — PG/OP communication — Routing — Global data communication No	Address area	
User data per DP slave — Inputs, max. — 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 • Address area, max. • User data per address area, max. 32 • User data per address area, max. Services — PG/OP communication — Routing — Global data communication No	— Inputs, max.	8 kbyte
- Inputs, max 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. • automatic baud rate search • Address area, max. • User data per address area, max. Services - PG/OP communication - Routing - Global data communication No	— Outputs, max.	8 kbyte
 — Outputs, max. PROFIBUS DP slave ● GSD file ● The latest GSD file is available at: http://www.siemens.com/profibus-gsd ● Transmission rate, max. ● automatic baud rate search ● Address area, max. ● User data per address area, max. Services — PG/OP communication — Routing — Global data communication No 	User data per DP slave	
PROFIBUS DP slave • GSD file The latest GSD file is available at: http://www.siemens.com/profibus-gsd • Transmission rate, max. • automatic baud rate search • Address area, max. • User data per address area, max. Services — PG/OP communication — Routing — Global data communication No	— Inputs, max.	244 byte
 GSD file The latest GSD file is available at: http://www.siemens.com/profibus-gsd Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. User data per address area, max. Services PG/OP communication Yes Routing Global data communication No	— Outputs, max.	244 byte
http://www.siemens.com/profibus-gsd Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. PG/OP communication Routing Global data communication No	PROFIBUS DP slave	
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 Address area, max. User data per address area, max. Services — PG/OP communication — Routing — Global data communication No 	Transmission rate, max.	12 Mbit/s
 User data per address area, max. Services — PG/OP communication — Routing — Global data communication No 	 automatic baud rate search 	Yes; only with passive interface
Services	 Address area, max. 	32
 — PG/OP communication — Routing — Global data communication Yes Yes; with interface active No 	 User data per address area, max. 	32 byte
 — Routing — Global data communication Yes; with interface active No 	Services	
— Global data communication No	— PG/OP communication	Yes
	— Routing	Yes; with interface active
— S7 basic communication No	 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 communication) 	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte
— Outputs	244 byte

Interface type PROFINET Physics Ethernet RJ45 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 Protocols • MPI No PROFINET IO Controller Yes; Also simultaneously with I-Device functionality • PROFINET IO Device Yes; Also simultaneously with IO Controller functionality • PROFIBUS DP master No PROFIBUS DP master No • PROFIBUS DP slave No • Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP • Web server Yes • Media redundancy Yes PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device	3. Interface	
Isolated Yes automatic detection of transmission rate Yes; 10/100 Mbit/s Autonegotiation Yes Autocrossing Yes Change of IP address at runtime, supported Interface types • Number of ports 2 • integrated switch Yes Protocols • MPI No • PROFINET IO Controller Yes; Also simultaneously with I-Device 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 • Media redundancy Yes PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode Yes; Old Time I isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device	Interface type	PROFINET
Autoragotiation Autocrossing Autocrossing Change of IP address at runtime, supported Profile Services PROFINET IO Controller PROFIBUS DP master No PROFIBUS DP slave PROFIBUS DP slave PROFIBUS DP slave PROFINET IO Controller Intercet	Physics	Ethernet RJ45
Autoregotiation Autocrossing Change of IP address at runtime, supported Interface types • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • 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 — Routing — S7 communication — S7 communication — S7 communication — S7 communication — Shared device Profinet IO (not simultaneously) Yes Yes Yes PROFINET IO Controller Yes Yes PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication Yes Yes — Isochronous mode Yes Yes Obe 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes	Isolated	Yes
Autocrossing Change of IP address at runtime, supported Yes Interface types • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server • Media redundancy • PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — S7 communication — S9 communication — Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Shared device — Yes — Shared device Yes Yes Yes Yes Yes PROFINET IO (not simultaneously) — Shared device	automatic detection of transmission rate	Yes; 10/100 Mbit/s
Change of IP address at runtime, supported Interface types • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET CBA • PROFIBUS DP master • No • Open IE communication • Web server • Media redundancy • Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — S7 communication — S6 communication — S6 communication — S7 communication — S6 communication — S6 communication — S6 communication — S7 communication — S6 communication — S8 communication — S8 communication — Yes — PG/OP communication — Yes — PG/OP communication — Yes — S7 communication — Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Shared device — Yes — Shared device	Autonegotiation	Yes
Interface types Number of ports Integrated switch Protocols MPI PROFINET IO Controller PROFIBUS DP master PROFIBUS DP slave Open IE communication Transmission rate, max. Services PROFINET IO Controller Transmission rate, max. Services PROFOP communication Yes Yes Wes Yes PROFINET IO Controller Yes PROFINET IO Controller Transmission rate, max. Services PROFOP communication Yes Yes PROFINET IO Controller Yes PROFINET IO Controller Yes PROFINET IO Controller Profop communication Yes Yes PROFINET IO Controller Profop communication Yes PROFINET IO Controller Profined instances: 32 Placetronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes	Autocrossing	Yes
No Protocols MPI PROFINET IO Controller PROFIBUS DP master PROFIBUS DP slave Media redundancy Media redundancy PROFINET IO Controller Transmission rate, max. Services PG/OP communication PG/OP communication PG/OP communication PG/OP communication PROFIDED PS or communication PROFIDED	Change of IP address at runtime, supported	Yes
integrated switch Yes Protocols MPI PROFINET IO Controller PROFINET IO Device PROFINET IO Device PROFINET CBA PROFIBUS DP master PROFIBUS DP slave PROFIBUS DP slave Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Psofinet IO (not simultaneously) Yes Pshared device Yes Profinet IO (not simultaneously) Yes	Interface types	
Protocols MPI PROFINET IO Controller PROFINET IO Device PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication Media redundancy PROFINET IO Controller Transmission rate, max. Services PG/OP communication Yes Tes Wes Yes Yes Yes PROFINET IO Controller Tes PROFINET IO Controller Transmission rate, max. PROFINET IO Controller PEG/OP communication Yes PROFINET IO Controller PEG/OP communication PEG/OP communication PEG/OP communication PEG/OP communication PEG/OP communication PEG/OP communication Yes PROFINET IO (not simultaneously) PEROFINET IO (not simultaneously) PEROFINET IO (not simultaneously)	Number of ports	2
MPI PROFINET IO Controller Yes; Also simultaneously with I-Device functionality PROFINET IO Device Yes; Also simultaneously with IO Controller functionality PROFINET CBA Yes PROFIBUS DP master No PROFIBUS DP slave PROFIBUS DP slave Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP Web server Media redundancy Yes PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes — Routing — S7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes	• integrated switch	Yes
PROFINET IO Controller PROFINET IO Device Yes; Also simultaneously with I-Device functionality PROFINET CBA PROFIBUS DP master No PROFIBUS DP slave Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP Web server Media redundancy Yes PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes	Protocols	
 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 PRO/OP communication Yes Yes PROFINET IO Controller Transmission rate, max. Services PG/OP communication Yes Services PS7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes 	• MPI	No
 PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server Media redundancy Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — Ves; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Shared device Yes Yes Yes OR 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes 	 PROFINET IO Controller 	Yes; Also simultaneously with I-Device functionality
 PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. Services PROFOP communication Routing S7 communication Yes; Via TCP/IP, ISO on TCP, and UDP Yes Media redundancy Yes Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes Services PS7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Shared device 	PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
 PROFIBUS DP slave Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. Services PG/OP communication Routing S7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Isochronous mode Shared device Yes Yes OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes 	PROFINET CBA	Yes
 Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP Web server Media redundancy Yes PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device 	 PROFIBUS DP master 	No
 ● Web server ● Media redundancy PROFINET IO Controller ● Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — Ves; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Shared device Yes Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes 	PROFIBUS DP slave	No
 Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device 	Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
PROFINET IO Controller ● Transmission rate, max. Services — PG/OP communication — Routing — S7 communication Yes — S7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device	Web server	Yes
 ◆ Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — S7 communication — Isochronous mode — Isochronous mode — Shared device 100 Mbit/s Yes Yes Yes Yes Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Yes 	Media redundancy	Yes
Services - PG/OP communication - Routing - S7 communication - S7 communication - S8 yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 - Isochronous mode - Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) - Shared device - Yes	PROFINET IO Controller	
 PG/OP communication Routing S7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Shared device 	Transmission rate, max.	100 Mbit/s
 Routing S7 communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Shared device 	Services	
 — S7 communication — Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 — Isochronous mode — Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device Yes	— PG/OP communication	Yes
number of instances: 32 — Isochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) — Shared device Yes	— Routing	Yes
PROFINET IO (not simultaneously) — Shared device Yes	— S7 communication	
	— Isochronous mode	
— Prioritized startun	— Shared device	Yes
— i nonuzeu startup	— 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	256
option "high flexibility"	61
— of which in line, max.	256
 Number of connectable IO Devices for RT, max. 	250
— of which in line, max.	256
Activation/deactivation of IO Devices	Yes
Number of IO Devices that can be	8
simultaneously activated/deactivated, max.	
IO Devices changing during operation	Yes
(partner ports), supported	
 Number of IO Devices per tool, max. 	8
 Device replacement without swap medium 	Yes
— Send cycles	$250~\mu s,500~\mu s,1$ ms; 2 ms, 4 ms (not in the case of IRT with "high 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.	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 PROFlenergy standard FB for I-Device
— Shared device	Yes
 Number of IO Controllers with shared 	2
device, 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	1021010
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	163
Number of connections, max.	32
· ·	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963,
 Local port numbers used at the system end 	34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
The same same same same same same same sam	
Protocols	
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	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	32
 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, 	Yes
supported	
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	32
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
 Number of connections, max. 	32
— Data length, max.	1 472 byte
Web server	
• supported	Yes
User-defined websites	Yes
 Number of HTTP clients 	5
Isochronous mode	
Isochronous operation (application synchronized up	Yes; Via 2nd 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	
• supported	Yes; via CP and loadable FC
PROFINET CBA (at set setpoint communication load)	
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 master/slave, max. 	24 000 byte
 Data length of all outgoing connections master/slave, max. 	24 000 byte
Number of device-internal and PROFIBUS interconnections	1 000
 Data length of device-internal und PROFIBUS interconnections, max. 	8 000 byte
Data length per connection, max.	1 400 byte
Remote interconnections with acyclic transmission	
— Sampling interval, min.	200 ms
Sampling Interval, Illin. Number of incoming interconnections	100
Number of outgoing interconnections	100
— Data length of all incoming	3 200 byte
interconnections, max.	
 Data length of all outgoing interconnections, max. 	3 200 byte
Data length per connection, max.	1 400 byte

Remote interconnections with cyclic transmission	
— Transmission frequency: Transmission	1 ms
interval, min.	
Number of incoming interconnections	300
 Number of outgoing interconnections 	300
Data length of all incoming	4 800 byte
interconnections, max.	4 000 1
 Data length of all outgoing interconnections, max. 	4 800 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	600
 Data length of all HMI variables, max. 	9 600 byte
PROFIBUS proxy functionality	
— 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,	0
min.	
 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

X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave usable for routing (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

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

— or 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	

Configuration	
Configuration software	
• STEP 7	Yes; V5.5 or higher
Programming	
Command set	see instruction list

0 °C

60 °C

• min.

• max.

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	
Dimensions Width	120 mm
	120 mm 125 mm
Width	
Width Height	125 mm
Width Height Depth	125 mm