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	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)	1 250 mA
Current consumption (in no-load operation), typ.	500 mA
Inrush current, typ.	4 A
I ² t	1.2 A²·s
Power loss	
Power loss Power loss, typ.	14 W
1 Ower 1000, typ.	17 **
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

 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 μs)
 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
• 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 only	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

Hardware configuration

— of which central

256

Number of digital inputs Digital outputs Number of digital outputs 0	Number of DP masters	
Number of operable FMs and CPs (recommended) FM CP, PHP CP, PHP CP, LAN Nack Racks, max. Modules per rack, max. Fries of day Clock Packs, max. Hardware clock (real-time) Pretentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Clock continues to run with the time at which the power failure occurred Poerating hours counter Number Number Number/Number range Range of values Range of values Tenetitive Clock synchronization Supported Supported Dey master Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Clock synchronization Supported Tes Must be restarted at each restart Tes Must be res	• integrated	2
FM • CP, PP • CP, PP • CP, LAN 10 Rack • Racks, max. • Modules per rack, max. • Modules per rack, max. • Modules per rack, max. • Hardware clock (real-time) • retentive and synchronizable • Deviation per day, max. • Behavior of the clock following POWER-ON • Behavior of the clock following expiry of backup period Operating hours counter • Number • Number (alues) • Cranularity • retentive • Ves; Must be restarted at each restart Clock synchronization • supported • supported • supported • to MPI, master • to DP, slave • to DP, slave • to DP, slave • in AS, slave • on Ethernet via NTP Ves; As client Digital inputs Number of digital inputs O Analog inputs	• via CP	4
CIDENTIANS OF THE PROPERTY OF	Number of operable FMs and CPs (recommended)	
OP, LAN Rack Racks, max. Modules per rack, max. Modules per rack, max. Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Power and the clock following expiry of backup period Operating hours counter Number Number ange of values Granularity Tetentive Supported	• FM	8
Rack Racks, max. Racks At 40 °C ambient temperature Rock and rack a	● CP, PtP	8
Racks, max. Modules per rack, max. Max. Modules per rack, max.	● CP, LAN	10
Modules per rack, max. **Time of day** Clock **Hardware clock (real-time)** **retentive and synchronizable** **Backup time** **Deviation per day, max.* **Deviation per day, max.* **Behavior of the clock following POWER-ON** **Behavior of the clock following expiry of backup period** **Operating hours counter* **Number** **Oto 3 **Oto 2*31 hours (when using SFC 101) **Oto 2*31 hours (when using SF	Rack	
Clock Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Number of tange of values Granularity retentive Supported To MPI, master Oth MPI, slave Oth MPI, sla	• Racks, max.	4
Clock Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Number 4	 Modules per rack, max. 	8
Clock Hardware clock (real-time) retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number Number 4	Time of day	
retentive and synchronizable Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Operating hours counter Number Number	-	
Backup time Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Operating hours counter Number 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 on Ethernet via NTP Yes; As client Digital inputs Number of digital outputs O Analog inputs	Hardware clock (real-time)	Yes
Deviation per day, max. Behavior of the clock following POWER-ON Behavior of the clock following expiry of backup period Clock continues running after POWER OFF Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number Number 4 Number/Number range 0 to 3 Range of values 0 to 2^31 hours (when using SFC 101) Granularity 1 h retentive Clock synchronization Supported Yes Oth MPI, master Oth MPI, slave Oth DP, slave Oth DP, slave Oth DR, slave Oth	• retentive and synchronizable	Yes
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 Clock continues to run with the time at which the power failure occurred Operating hours counter Number Number 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; 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 O Analog inputs	Backup time	6 wk; At 40 °C ambient temperature
Behavior of the clock following expiry of backup period Operating hours counter Number Number Number A Number/Number range Range of values Granularity retentive Yes; Must be restarted at each restart Clock synchronization supported to MPI, master to MPI, slave to DP, slave in AS, slave on Ethernet via NTP Digital inputs Number of digital outputs Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred A Clock continues to run with the time at which the power failure occurred A Clock continues to run with the time at which the power failure occurred Clock continues to run with the time at which the power failure occurred A Clock continues to run with the time at which the power failure occurred O to 3 A Clock continues to run with the time at which the power failure occurred A Clock continues to run with the time at which the power failure occurred A Clock continues to run with the time at which the power failure occurred O to 3 A clock continues to run with the time at which the power failure occurred O to 3 A clock continues to run with the time at which the power failure occurred O to 3 A clock continues to run with the time at which the power failure occurred O to 3 A clock continues to run with the time at which the power failure occurred O to 3 O to 2^31 hours (when using SFC 101) I h P continues to a clock continues to	Deviation per day, max.	10 s; Typ.: 2 s
period occurred Operating hours counter Number Number Number/Number range O to 3 Range of values Granularity I h retentive Yes; Must be restarted at each restart Clock synchronization supported Yes Oth MPI, master Oth MPI, slave Oth DP, master Yes; With DP slave only slave clock Oth DP, slave Oth AS, master Oth AS, slave Oth AS, slave Oth Character Other with AS and the country of digital inputs Number of digital outputs Number of digital outputs Other AS Analog inputs	 Behavior of the clock following POWER-ON 	Clock continues running after POWER OFF
Operating hours counter • Number • Number	Behavior of the clock following expiry of backup	Clock continues to run with the time at which the power failure
Number Number/Number range Number/Number range O to 3 Range of values O to 2^31 hours (when using SFC 101) I h retentive Yes; Must be restarted at each restart Clock synchronization Supported Ves O to MPI, master O to MPI, slave O to DP, master Ves; With DP slave only slave clock ODP, slave On Ethernet via NTP Pes Number of digital outputs O to 0 to	period	occurred
Number/Number range Range of values Range of values Granularity In retentive Ves; Must be restarted at each restart Clock synchronization supported Ves to MPI, master Ves to DP, master Ves; With DP slave only slave clock Ves in AS, master Ves in AS, slave On Ethernet via NTP Number of digital outputs Number of digital outputs O to 2^31 hours (when using SFC 101) 1 h Ves; Must be restarted at each restart Ves; Wuth DP slave each restart Ves Ves Ses Supported Yes Ves Ves Ves Ves Ves Ves Ves Ses Ses client	Operating hours counter	
Range of values Granularity retentive Yes; Must be restarted at each restart Clock synchronization supported to MPI, master to DP, master to DP, slave in AS, master in AS, slave on Ethernet via NTP Digital inputs Number of digital outputs Number of digital outputs 0 to 2^31 hours (when using SFC 101) 1 h 1 h 1 h 1 h 1 h 1 h 1 h 1 h 1 h 1 h	Number	4
Granularity retentive Yes; Must be restarted at each restart Clock synchronization supported to MPI, master to MPI, slave to DP, master to DP, slave in AS, master in AS, slave on Ethernet via NTP Pigital inputs Number of digital outputs Number of digital outputs Number of digital outputs Number of digital outputs O Yes; Must be restarted at each restart Yes Wust be restarted at each restart O Yes Yes Yes Yes Yes Yes Yes Y	Number/Number range	0 to 3
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 Digital inputs Number of digital inputs Number of digital outputs Number of digital outputs O Analog inputs	Range of values	0 to 2^31 hours (when using SFC 101)
Clock synchronization • supported • to MPI, master • to MPI, slave • to DP, master • to DP, slave • to DP, slave • in AS, master • in AS, slave • on Ethernet via NTP Digital inputs Number of digital inputs Number of digital outputs Number of digital outputs Number of digital outputs O Analog inputs	Granularity	1 h
 supported to MPI, master to MPI, slave to DP, master to DP, slave to DP, slave in AS, master in AS, slave on Ethernet via NTP Digital inputs Number of digital inputs Number of digital outputs Analog inputs 	• retentive	Yes; Must be restarted at each restart
to MPI, master to MPI, slave to DP, master to DP, master to DP, slave to DP, slave in AS, master in AS, slave on Ethernet via NTP Digital inputs Number of digital inputs Number of digital outputs Number of digital outputs Number of digital outputs O Analog inputs	Clock synchronization	
 to MPI, slave to DP, master to DP, slave to DP, slave in AS, master in AS, slave on Ethernet via NTP Digital inputs Number of digital inputs Number of digital outputs Number of digital outputs O Analog inputs	• supported	Yes
 to DP, master to DP, slave to DP, slave in AS, master in AS, slave on Ethernet via NTP Ves; As client Digital inputs Number of digital inputs Digital outputs Number of digital outputs Analog inputs Analog inputs Yes; With DP slave only slave clock Yes O 	● to MPI, master	
 to DP, slave in AS, master in AS, slave on Ethernet via NTP Ves; As client Digital inputs Number of digital inputs Digital outputs Number of digital outputs Number of digital outputs O Analog inputs	● to MPI, slave	
 in AS, master in AS, slave on Ethernet via NTP Ves; As client Digital inputs Number of digital inputs Digital outputs Number of digital outputs Number of digital outputs O Analog inputs	• to DP, master	
 in AS, slave on Ethernet via NTP Yes; As client Digital inputs Number of digital inputs Digital outputs Number of digital outputs Number of digital outputs O Analog inputs	● to DP, slave	
● on Ethernet via NTP Ves; As client Digital inputs Number of digital inputs Digital outputs Number of digital outputs O Analog inputs	● in AS, master	
Digital inputs Number of digital inputs Digital outputs Number of digital outputs O Analog inputs	• in AS, slave	
Number of digital inputs Digital outputs Number of digital outputs 0 Analog inputs	on Ethernet via NTP	Yes; As client
Digital outputs Number of digital outputs Analog inputs	Digital inputs	
Number of digital outputs O Analog inputs	Number of digital inputs	0
Analog inputs	Digital outputs	
	Number of digital outputs	0
	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

 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 — Pai/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. • utomatic 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. — 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 Vest yes; with interface active 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	
 automatic baud rate search Address area, max. User data per address area, max. Services — PG/OP communication — Routing — Global data communication No Yes; only with passive interface 32 Yes; only with passive interface 32 Yes; with passive interface 32 Yes; with passive interface 32 Yes; with interface active No	• GSD file	
 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

3. Interface	
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	Yes
Protocols	
• MPI	No
 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	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
— Routing	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	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,	256
max.	200
— 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
	1 024 byte
User data per submodule, max. PROFINET CBA	1 024 byte
	Yes
acyclic transmission	
• cyclic transmission	Yes
Open IE communication	20
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	
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, supported 	Yes
• 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 to terminal)	Yes; Via 2nd PROFIBUS DP or PROFINET interface
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
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 interconnections, max. 	4 800 byte
— Data length of all outgoing	4 800 byte
interconnections, max.	
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, 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
total number of instances, max.	

• 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.

	(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 °C
• max.	60 °C
Configuration	

Configuration software

Command set

• STEP 7
Programming

Yes; V5.5 or higher

see instruction list

• Northern Levels	8
Nesting levels	
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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