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
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
Dawar laga	
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
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 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	
• procent	Yes
• present	
• Type	SFB
	SFB 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 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
Address area	
I/O address area	
• 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	2
• integrated	2
via CP Number of energials EMs and CPs (recommended)	4
Number of operable FMs and CPs (recommended)	0
• FM	8
• CP, PtP	8
• CP, LAN	10

Rack	
• Racks, max.	4
Modules per rack, max.	8
Time of day	
Clock	
 Hardware clock (real-time) 	Yes
 retentive and synchronizable 	Yes
Backup time	6 wk; At 40 °C ambient temperature
 Deviation per day, max. 	10 s; Typ.: 2 s
 Behavior of the clock following POWER-ON 	Clock continues running after POWER OFF
 Behavior of the clock following expiry of backup period 	Clock continues to run with the time at which the power failure occurred
Operating hours counter	
Number	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
● in AS, master	Yes
• in AS, slave	Yes
Digital inputs	
Number of digital inputs	0
Digital outputs	
Number of digital outputs	0
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	0
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

Power supply to interface (15 to 30 V DC), max. Protocols • MPI	Yes 150 mA
Protocols	150 mA
▲ MDI	
• IVIFI	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 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. 	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 communication) 	Yes
— 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
PROFIBUS DP slave	Yes; A DP slave at both interfaces simultaneously is not possible
Open IE communication	No
Web server	No
PROFIBUS DP master	
Transmission rate, max.	12 Mbit/s
 Number of DP slaves, max. 	124

Services

— Routing

— PG/OP communication

Yes 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. 	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	
THO IDOC DI SIGVO	
• GSD file	The latest GSD file is available at: http://www.siemens.com/profibus-gsd
• GSD file	http://www.siemens.com/profibus-gsd
GSD fileTransmission rate, max.	http://www.siemens.com/profibus-gsd 12 Mbit/s
 GSD file Transmission rate, max. automatic baud rate search	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface
 GSD file Transmission rate, max. automatic baud rate search Address area, max. 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte
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 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services — PG/OP communication — Routing — Global data communication 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services PG/OP communication Routing Global data communication S7 basic communication 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No No
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No No Yes
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 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services PG/OP communication Routing Global data communication S7 basic communication S7 communication S7 communication S7 communication, as client S7 communication, as server Direct data exchange (slave-to-slave) 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No No Yes No Yes; Connection configured on one side only
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication, as client — S7 communication, as server — Direct data exchange (slave-to-slave communication) 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No No Yes No Yes Connection configured on one side only Yes
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services PG/OP communication Routing Global data communication S7 basic communication S7 communication S7 communication S7 communication, as client S7 communication, as server Direct data exchange (slave-to-slave communication) DPV1 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No No Yes No Yes Connection configured on one side only Yes
 GSD file Transmission rate, max. automatic baud rate search Address area, max. User data per address area, max. Services — PG/OP communication — Routing — Global data communication — S7 basic communication — S7 communication — S7 communication, as client — S7 communication, as server — Direct data exchange (slave-to-slave communication) — DPV1 Transfer memory 	http://www.siemens.com/profibus-gsd 12 Mbit/s Yes; only with passive interface 32 32 byte Yes Yes; with interface active No No Yes No Yes No Yes; Connection configured on one side only Yes No

Interface type PROFINET Physics Ethernet RJ45 Isolated Yes automatic detection of transmission rate Yes; 10/100 Mbt/s Autoreopsitation Yes Change of IP address at runtime, supported Yes Interface types • Number of ports Yes • 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 IO Device Yes; Also simultaneously with IO Controller functionality • PROFIBUS DP master No • PROFIBUS DP slave No • Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP • Web server Yes **PROFIBUT O Controller • Transmission rate, max. 100 Mbt/s **Services - PG/OP communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 - Isochronous mode Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 - Isochronous mode Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 - Shared device Yes - Prioritized startup - Number of IO devices with prioritized startup, max. - Number of IO Devices with IRT, max. 64 - Number of IO Devices with IRT, max. 64 - Number of IO Devices with IRT, max. 64 - Number of IO Devices with IRT, max. 64 - Number of connectable IO Devices for RT, max. - Of which in line, max. 61 - Number of connectable IO Devices for RT, max of which in line, max Activation/deactivation of IO Devices of RT, max Activation/deactivation of IO Devices of RT, max of which in line, max Activation/deactivation of IO Devices of RT, max Activation/deactivation of IO Devices of RT, max Activation/deactivation of IO Devices of RT, max Activation/deactivation of IO Devices of RT Activation/deactivation of IO Device	3. Interface	
Isolated automatic detection of transmission rate Yes; 10/100 Mbit/s Autonegotilation 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 GBA Yes • PROFIBUS DP master No • PROFIBUS DP slave No • Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP • 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) — Number of IO Devices with IRT, max. 64 — Of which in line, max. 61 — Number of connectable IO Devices for RT, max. — of which in line, max. 61 — Number of connectable IO Devices for RT, max. — of which in line, max. 61 — Number of connectable IO Devices for RT, max. — of which in line, max. 61 — Number of connectable IO Devices for RT, max. — of which in line, max. 62 — of which in line, max. 61 — Number of connectable IO Devices for RT, max. — of which in line, max. 61	Interface type	PROFINET
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Autoregotiation Autorossing Change of IP address at runtime, supported Interface types • Number of ports • integrated switch Protocols • MPI • PROFINET IO Controller • PROFINET CBA • PROFIBUS DP slave • Open IE communication • Web server • Transmission rate, max. — PGOP communication — Routing — S7 communication — Routing — S7 communication — PROFINET IO devices with prioritized startup, max. — Number of IO Devices with IRT and the option "high flexibility" — of which in line, max. — Number of connectable IO Devices for RT, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — Of whic	Isolated	Yes
Autocrossing Yes Change of IP address at runtime, supported Yes Interface types • Number of ports • Integrated switch Yes Protocols • MPI • PROFINET IO Controller • PROFINET IO Device • PROFIBED SDP master • PROFIBUS DP slave • Open IE communication • Web server • PGIOP communication - Routing - Routing - S7 communication - Routing - S7 communication - Routing - S7 communication - Shared device - Prioritized startup - Number of Io Devices with IRT, max Of which in line, max Number of Io Devices with IRT and the option "high flexibility" - of which in line, max of which in line, max.	automatic detection of transmission rate	Yes; 10/100 Mbit/s
Change of IP address at runtime, supported Interface types Number of ports Integrated switch No PROFINET IO Controller PROFINET IO Device PROFIBUS DP master PROFIBUS DP slave Open IE communication Ves switch Transmission rate, max. Services PROFINET IO Controller Transmission rate of Devices with IPT and the option "high flexibility" PROFINET IO Controller Shared device Prioritized startup No No PROFINET IO Controller Prioritized stortup, max. Aumber of IO Devices with IRT and the option "high flexibility" — of which in line, max. No No PROFINET IO Controller Prior thick of the prioritized store of which in line, max. No No PROFINET IO Controller Prior thick of the prioritized store of which in line, max. Number of IO Devices with IRT and the option "high flexibility" — of which in line, max. Number of which in line, max. Of which in line, max. Number of which in line, max. Of which in line, max. Number of which in line, max.	Autonegotiation	Yes
Interface types ● Number of ports ● Integrated switch Protocols ● MPI ● PROFINET IO Controller ● PROFINET IO Device ● PROFINET BA ● PROFIBUS DP master ● PROFIBUS DP slave ● Open IE communication ● Web server ● Transmission rate, max. ■ PG/OP communication ■ S7 communication ■ S8 covices ■ Prioritized startup ■ Number of IO devices with IRT, max. ■ Of which In line, max. ■ Number of IO Devices with IRT and the option "high flexibility" ■ of which in line, max. ■ Number of connectable IO Devices for RT, max. ■ Number of connectable IO Devices for RT, max. ■ of which in line, max.	Autocrossing	Yes
Number of ports integrated switch Yes Protocols MPI No PROFINET IO Controller PROFINET IO Device PROFINET BA Yes PROFIBUS DP master PROFIBUS DP slave No Open IE communication Web server PROFINET IO Controller Transmission rate, max. PGOP Communication Routing Services PGOP Communication Yes Services PGOP Communication Yes Services PGOP Shared device Prioritized startup Number of IO devices with IRT, max. of which in line, max. Number of Io Devices for RT, max. Number of connectable IO Devices for RT, max. Number of own with Internation (Pass) and the priority of the policy in Internation (Pass) and the policy internation (Pass)	Change of IP address at runtime, supported	Yes
integrated switch Protocols MPI PROFINET IO Controller PROFINET IO Device PROFINET OB Ves: Also simultaneously with I-Device functionality PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server PROFINET IO Controller Transmission rate, max. Services PG/OP communication PG/OP communication PSOF commun	Interface types	
Protocols MPI PROFINET IO Controller PROFINET IO Device PROFINET IO Device PROFINET GBA PROFIBUS DP master PROFIBUS DP master PROFIBUS DP slave POPENIET CONTROLLER PROFINET IO (not simultaneously) PROFINET IO (not simultaneously) PROFINET IO (not simultaneously) PROFINET IO (not simultaneously) PROFINET IO Controller IO Devices with IRT, max. Pumber of IO Devices with IRT, max. Pof which In line, max. Pof which In line, max. Pumber of Connectable IO Devices for RT, max. Pumber of connectable IO Devices for RT, max. Pumber of connectable IO Devices for RT, max. Pumber of which in line, max. Pumber of connectable IO Devices for RT, max. Pumber of which in line, max. Pumber of which in line, max. Pumber of which in line, max. Pumber of connectable IO Devices for RT, max. Pumber of which in line, max. Pumber of which in line, max. Pumber of which in line, max. Pof which in line, max. Pumber of which in line, max.	Number of ports	2
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PROFINET IO Controller PROFINET CBA PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication PROFINET IO Controller Transmission rate, max. Services PROFINET PST communication PST communicatio	Protocols	
PROFINET IO Device PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server Transmission rate, max. Services PROFINET IO Controller PROFINET IO Communication Yes: Via TCP/IP, ISO on TCP, and UDP Transmission rate, max. Services PROFINET IO Controller Transmission rate, max. Services PROFINET IO Communication Pesson Routing Services PSOFINET IO Communication Yes PROFINET IO Communication Yes Profined In Loadable FBs, max. configurable connections: 16, max. number of instances: 32 Placeton Instances: 32 Placeton Instances: 32 Profined device Prioritized startup Yes Profined IO Covices with prioritized Sartup, max. Number of IO devices with prioritized Sartup, max. Number of IO devices with IRT, max. 64 Pothich in line, max. 656 Pothich in line, max. 661 Pothich in line, max. 67 Pothich in line, max. 68 Pothich in line, max. 69 Pothich in line, max. 61	• MPI	No
 PROFINET CBA PROFIBUS DP master No PROFIBUS DP slave Open IE communication Web server Yes Transmission rate, max. PROFINET IO Controller Transmission rate, max. PG/OP communication Routing Services PG/OP communication Routing S7 communication Hsochronous mode Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Hsochronous mode Yes; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) Shared device Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. Aumber of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. Of which in line, max. Number of connectable IO Devices for RT, max. Of which in line, max. Number of connectable IO Devices for RT, max. Of which in line, max. 	 PROFINET IO Controller 	Yes; Also simultaneously with I-Device functionality
PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server Yes PROFINET IO Controller Transmission rate, max. PG/OP communication Pes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Services Isochronous mode Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which in line, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. Of which in line, max.	PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
PROFIBUS DP slave Open IE communication Web server PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Routing S7 communication Yes; Via TCP/IP, ISO on TCP, and UDP Yes PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes Yes Yes Services PG/OP communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 Placetime of instances: 32 Placetime of instances: 32 Profinitized startup Yes Prioritized startup Yes Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. Of which in line, max. Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. Of which in line, max. Services 100 Mbit/s 100 Mitikane 100 Mitikane 100 Mitikane 100 Mitikane 100 Mitikane 100 Mitikane 100	PROFINET CBA	Yes
Open IE communication ∀es; Via TCP/IP, ISO on TCP, and UDP ∀es PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services — PG/OP communication — Routing — S7 communication — S7 communication — Isochronous mode — Isochronous mode — Prioritized startup — Shared device — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Of which IO devices with IRT, max. — of which in line, max. — Number of connectable IO Devices for RT, max. — Number of connectable IO Devices for RT, max. — Number of connectable IO Devices for RT, max. — Of which in line, max.	PROFIBUS DP master	No
PROFINET IO Controller ● Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes Post communication Yes Yes Post communication Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 I sochronous 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. Number of connectable IO Devices, max. 256 Of which IO devices with IRT, max. 64 Number of IO Devices with IRT and the option "high flexibility" of which in line, max. 61 Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. Of which in line, max. 61 Number of connectable IO Devices for RT, max. Of which in line, max. 61 Number of connectable IO Devices for RT, max. Of which in line, max. 61	PROFIBUS DP slave	No
PROFINET IO Controller ● Transmission rate, max. 100 Mbit/s Services - PG/OP communication Yes - Routing Yes - S7 communication Yes; with loadable FBs, max. configurable connections: 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 Number of connectable IO Devices, max. 256 - Of which IO devices with IRT, max. 64 - Number of IO Devices with IRT and the option "high flexibility" - of which in line, max. 61 - Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max of which in line, max. 61 - Number of connectable IO Devices for RT, max of which in line, max. 6266	Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
● Transmission rate, max. Services — PG/OP communication — Routing — S7 communication — Isochronous mode — Isochronous mode — Shared device — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Of which in line, max. — Number of ID Devices for RT, max. — Number of connectable IO Devices for RT, max. — Number of connectable IO Devices for RT, max. — Of which in line, max.	·	Yes
Services - PG/OP communication - Routing - S7 communication - Isochronous mode - Isochronous mode - Isochronous mode - Isochronous mode - Shared device - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Of which I line, max Number of IO Devices with IRT and the option "high flexibility" - of which in line, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Of which in line, max.	PROFINET IO Controller	
PG/OP communication Routing S7 communication S7 communication Isochronous mode Isochronous mode Isochronous mode Shared device Shared device Prioritized startup Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Of which In line, max Number of IO Devices with IRT and the option "high flexibility" of which in line, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Of which in line, max.	Transmission rate, max.	100 Mbit/s
- Routing - S7 communication - S7 communication - Isochronous mode - Isochronous mode - Isochronous mode - Shared device - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Of which in line, max Number of IO Devices with IRT and the option "high flexibility" - of which in line, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Of which in line, max.	Services	
 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 Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. Of which in line, max. Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. Of which in line, max. S56 	— PG/OP communication	Yes
- S7 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 Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. of which in line, max. Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. Of which in line, max. 256		Yes
PROFINET IO (not simultaneously) — Shared device Yes — Prioritized startup Yes — Number of IO devices with prioritized 32 startup, max. — 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" — of which in line, max. 61 — Number of connectable IO Devices for RT, max. 61 — Number of connectable IO Devices for RT, max. 61 — Number of which in line, max. 256		
 — Shared device — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Of which IO devices with IRT, max. — of which in line, max. — Number of IO Devices with IRT and the option "high flexibility" — of which in line, max. — Number of connectable IO Devices for RT, max. — Number of connectable IO Devices for RT, max. — of which in line, max. 	— Isochronous mode	
 Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. of which in line, max. Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. of which in line, max. 256 	— Shared device	Yes
 Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. of which in line, max. Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. Number of connectable IO Devices for RT, max. of which in line, max. 256 		Yes
startup, max. — Number of connectable IO Devices, max. — Of which IO devices with IRT, max. — of which in line, max. — Number of IO Devices with IRT and the option "high flexibility" — of which in line, max. — Number of connectable IO Devices for RT, max. — of which in line, max. — of which in line, max. 256	·	32
 Of which IO devices with IRT, max. of which in line, max. Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. of which in line, max. of which in line, max. 	•	
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 Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. of which in line, max. 256 	— Of which IO devices with IRT, max.	64
 Number of IO Devices with IRT and the option "high flexibility" of which in line, max. Number of connectable IO Devices for RT, max. of which in line, max. 256 	— of which in line, max.	64
 of which in line, max. Number of connectable IO Devices for RT, max. of which in line, max. 256 	— Number of IO Devices with IRT and the	256
 Number of connectable IO Devices for RT, max. of which in line, max. 256 		61
— of which in line, max.	— Number of connectable IO Devices for RT,	256
		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 	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	$250~\mu s$ 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 device, max. 	2
Transfer memory	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
Submodules	
— Number, max.	64
 User data per submodule, max. 	1 024 byte
PROFINET CBA	
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	
 Number of connections, max. 	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	

ms; PROFINET MRP
iii, i ree iive i witt
via integrated PROFINET interface and loadable FBs
O byte
68 byte
50 Byte
via integrated PROFINET interface and loadable FBs
68 byte
via integrated PROFINET interface and loadable FBs
2 byte
Via 2nd PROFIBUS DP or PROFINET interface
yte
yte
yte
yte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with JT or X_GET as server)
yte; 76

supported	Yes		
as server	Yes		
as client	Yes; via integrated PROFINET interface and loadable FB or via		
as client	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 frequency: Sampling time, min.	200 ms		
 Number of incoming interconnections 	100		
 Number of outgoing interconnections 	100		
 Data length of all incoming interconnections, max. 	3 200 byte		
 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 interval, min.	1 ms		
Number of incoming interconnections	300		
Number of outgoing interconnections	300		
Data length of all incoming	4 800 byte		
interconnections, max.			
 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, 	30
max.	
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.
	(active). Hax. 14, 70 as i NOI INC 1. 40 Hax.
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	
• STEP 7	Yes; V5.5 or higher
Programming	
Command set	see instruction list
 Nesting levels 	
. 0 . 1 . 1 . (0.50)	8
System functions (SFC)	8 see instruction list
System functions (SFC)System function blocks (SFB)	
	see instruction list see instruction list
• System function blocks (SFB)	see instruction list see instruction list Yes
System function blocks (SFB) Programming language	see instruction list see instruction list
System function blocks (SFB) Programming language — LAD	see instruction list see instruction list Yes
 System function blocks (SFB) Programming language LAD FBD 	see instruction list see instruction list Yes Yes
System function blocks (SFB) Programming language — LAD — FBD — STL	see instruction list see instruction list Yes Yes Yes
System function blocks (SFB) Programming language — LAD — FBD — STL — SCL	see instruction list see instruction list Yes Yes Yes Yes Yes
System function blocks (SFB) Programming language — LAD — FBD — STL — SCL — CFC	see instruction list see instruction list Yes Yes Yes Yes Yes Yes

• 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

07/10/2020 last modified: