## **SIEMENS**

## Data sheet

## 6ES7314-6EH04-0AB0



SIMATIC S7-300, CPU 314C-2PN/DP COMPACT CPU WITH 192 KBYTE WORKING MEMORY, 24 DI/16 DO, 4AI, 2AO, 1 PT100, 4 FAST COUNTERS (60 KHZ), 1. INTERFACE MPI/DP 12MBIT/S, 2. INTERFACE ETHERNET PROFINET, WITH 2 PORT SWITCH, INTEGRATED 24V DC POWER SUPPLY, FRONT CONNECTOR (2 X 40PIN) AND MICRO MEMORY CARD REQUIRED

General information	
Hardware product version	01
Firmware version	V3.3
Engineering with	
Programming package	STEP 7 V5.5 or higher with HSP 191
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	Miniature circuit breaker, type C; min. 2 A; miniature circuit
(recommendation)	breaker type B, min. 4 A
Mains buffering	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
• Repeat rate, min.	1 s
Digital inputs	
Load voltage L+	
— Rated value (DC)	24 V

Decrees a clarity marketing	Yes
— Reverse polarity protection	165
Digital outputs	
Load voltage L+	24.1/
— Rated value (DC)	24 V
<ul> <li>Reverse polarity protection</li> </ul>	No
Input current	
Current consumption (rated value)	850 mA
Current consumption (in no-load operation), typ.	190 mA
Inrush current, typ.	5 A
l²t	0.7 A <sup>2</sup> ·s
Digital inputs	
<ul><li>from load voltage L+ (without load), max.</li></ul>	80 mA
Digital outputs	
● from load voltage L+, max.	50 mA
Power loss	
Power loss, typ.	14 W
Memory	
Work memory	
• integrated	192 kbyte
• expandable	No
Size of retentive memory for retentive data	64 kbyte
blocks	
Load memory	
• Plug-in (MMC)	Yes
● Plug-in (MMC), max.	8 Mbyte
<ul> <li>Data management on MMC (after last</li> </ul>	10 y
programming), min.	
Backup	
• present	Yes; Guaranteed by MMC (maintenance-free)
without battery	Yes; Program and data
CPU processing times	
for bit operations, typ.	0.06 µs
for word operations, typ.	0.12 µs
for fixed point arithmetic, typ.	0.16 µs
for floating point arithmetic, typ.	0.59 μs
CPU-blocks	
Number of blocks (total)	1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used.
DB	
Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte

3	
Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
C	
Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
DB .	
Description	see instruction list
• Size, max.	64 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	1; OB 1
<ul> <li>Number of time alarm OBs</li> </ul>	1; OB 10
<ul> <li>Number of delay alarm OBs</li> </ul>	2; OB 20, 21
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	4; OB 32, 33, 34, 35
<ul> <li>Number of process alarm OBs</li> </ul>	1; OB 40
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55, 56, 57
<ul> <li>Number of isochronous mode OBs</li> </ul>	1; OB 61; only for PROFINET
Number of startup OBs	1; OB 100
<ul> <li>Number of asynchronous error OBs</li> </ul>	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
<ul> <li>additional within an error OB</li> </ul>	4

S7 counter       256         Retentivity       Yes         — adjustable       Yes         — lower limit       0         — upper limit       255         — preset       Z 0 to Z 7         Counting range       Yes         — can be set       Yes         — lower limit       0         — upper limit       999
Retentivity           — adjustable         Yes           — lower limit         0           — upper limit         255           — preset         Z 0 to Z 7           Counting range           — can be set         Yes           — lower limit         0
— adjustable       Yes         — lower limit       0         — upper limit       255         — preset       Z 0 to Z 7         Counting range         — can be set       Yes         — lower limit       0
— lower limit       0         — upper limit       255         — preset       Z 0 to Z 7         Counting range         — can be set       Yes         — lower limit       0
— upper limit       255         — preset       Z 0 to Z 7         Counting range         — can be set       Yes         — lower limit       0
<ul> <li>— preset</li> <li>Counting range</li> <li>— can be set</li> <li>— lower limit</li> <li>Z 0 to Z 7</li> <li>Yes</li> <li>0</li> </ul>
Counting range  — can be set — lower limit  O
<ul><li>— can be set</li><li>— lower limit</li><li>Yes</li><li>0</li></ul>
— lower limit 0
000
— upper limit 999
IEC counter
• present Yes
• Type SFB
Number     Unlimited (limited only by RAM capacity)
S7 times
• Number 256
Retentivity

— adjustable	Yes
— lower limit	0
— upper limit	255
	No retentivity
— preset	No retentivity
Time range	10 ms
— lower limit	
— upper limit	9 990 s
IEC timer	Vaa
• present	Yes
• Type	SFB
Number	Unlimited (limited only by RAM capacity)
Data areas and their retentivity	
retentive data area in total	All, max. 64 KB
Flag	
• Number, max.	256 byte
Retentivity available	Yes; MB 0 to MB 255
<ul> <li>Retentivity preset</li> </ul>	MB 0 to MB 15
<ul> <li>Number of clock memories</li> </ul>	8; 1 memory byte
Data blocks	
Number, max.	1 024; Number range: 1 to 16000
• Size, max.	64 kbyte
<ul> <li>Retentivity adjustable</li> </ul>	Yes; via non-retain property on DB
<ul> <li>Retentivity preset</li> </ul>	Yes
Local data	
• per priority class, max.	32 kbyte; Max. 2048 bytes per block
Address area	
I/O address area	
• Inputs	2 048 byte
<ul><li>Outputs</li></ul>	2 048 byte
of which distributed	
— Inputs	2 003 byte
— Outputs	2 010 byte
Process image	
• Inputs	2 048 byte
<ul><li>Outputs</li></ul>	2 048 byte
<ul> <li>Inputs, adjustable</li> </ul>	2 048 byte
Outputs, adjustable	2 048 byte
• Inputs, default	256 byte
Outputs, default	256 byte
Default addresses of the integrated channels	
— Digital inputs	136.0 to 138.7
•	

— Digital outputs	136.0 to 137.7
— Analog inputs	800 to 809
	800 to 803
— Analog outputs  Subprocess images	000 to 000
Number of subprocess images, max.	1; With PROFINET IO, the length of the user data is limited to
• Number of Subprocess images, max.	1600 bytes
Digital channels	·
• Inputs	16 048
. — of which central	1 016
Outputs	16 096
— of which central	1 008
Analog channels	
• Inputs	1 006
of which central	253
Outputs	1 007
— of which central	250
Of Which defined	
Hardware configuration	
Number of expansion units, max.	3
Number of DP masters	
• integrated	1
• via CP	4
Number of operable FMs and CPs (recommended)	
• FM	8
• CP, PtP	8
• CP, LAN	10
Rack	
• Racks, max.	4
<ul><li>Modules per rack, max.</li></ul>	8; In rack 3 max. 7
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	Clock continues to run with the time at which the power failure
period	occurred
Operating hours counter	
Number	1
<ul><li>Number/Number range</li></ul>	0
Range of values	0 to 2^31 hours (when using SFC 101)

Granularity	1 hour
• 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	24
<ul> <li>of which inputs usable for technological functions</li> </ul>	16
integrated channels (DI)	24
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Number of simultaneously controllable inputs	
horizontal installation	
— up to 40 °C, max.	24
— up to 60 °C, max.	12
vertical installation	
— up to 40 °C, max.	12
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	8 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes; 0.1 / 0.3 / 3 / 15 ms (You can reconfigure the input delay of the standard inputs during program runtime. Please note that under certain circumstances your newly set filter time may not be effective until the next filter cycle.)
— Rated value	3 ms
for counter/technological functions	
— at "0" to "1", max.	8 µs; Minimum pulse width/minimum pause between pulses at maximum counting frequency
Cable length	
• shielded, max.	1 000 m; 50 m for technological functions

• unshielded, max.	600 m; For technological functions: No
for technological functions	
— shielded, max.	50 m; at maximum count frequency
— unshielded, max.	not allowed

— Siliciucu, max.	oo iii, at maximam ooant noquency
— unshielded, max.	not allowed
Digital outputs	
Number of digital outputs	16
<ul> <li>of which high-speed outputs</li> </ul>	4; Notice: You cannot connect the fast outputs of your CPU in parallel
integrated channels (DO)	16
Short-circuit protection	Yes; Clocked electronically
<ul> <li>Response threshold, typ.</li> </ul>	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
● on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	4 kΩ
Output voltage	
● for signal "1", min.	L+ (-0.8 V)
Output current	
● for signal "1" rated value	500 mA
• for signal "1" permissible range, min.	5 mA
• for signal "1" permissible range, max.	0.6 A
• for signal "1" minimum load current	5 mA
• for signal "0" residual current, max.	0.5 mA
Parallel switching of two outputs	
• for uprating	No
<ul> <li>for redundant control of a load</li> </ul>	Yes
Switching frequency	
with resistive load, max.	100 Hz
<ul><li>with inductive load, max.</li></ul>	0.5 Hz
● on lamp load, max.	100 Hz
• of the pulse outputs, with resistive load, max.	2.5 kHz
Total current of the outputs (per group)	
horizontal installation	
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A
vertical installation	
— up to 40 °C, max.	2 A
Cable length	
• shielded, max.	1 000 m

• unshielded, max.	600 m
Analog inputs	
Number of analog inputs	5
<ul> <li>For voltage/current measurement</li> </ul>	4
<ul> <li>For resistance/resistance thermometer measurement</li> </ul>	1
integrated channels (AI)	5; 4 x current/voltage, 1 x resistance
permissible input voltage for current input (destruction limit), max.	5 V; Permanent
permissible input voltage for voltage input (destruction limit), max.	30 V; Permanent
permissible input current for voltage input (destruction limit), max.	0.5 mA; Permanent
permissible input current for current input (destruction limit), max.	50 mA; Permanent
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges	
Voltage	Yes; ±10 V / 100 k $\Omega$ ; 0 V to 10 V / 100 k $\Omega$
• Current	Yes; ±20 mA / 100 $\Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$
Resistance thermometer	Yes; Pt 100 / 10 MΩ
Resistance	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
<ul><li>Input resistance (0 to 10 V)</li></ul>	100 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
<ul> <li>Input resistance (0 to 20 mA)</li> </ul>	100 Ω
• -20 mA to +20 mA	Yes
<ul> <li>Input resistance (-20 mA to +20 mA)</li> </ul>	100 Ω
• 4 mA to 20 mA	Yes
<ul> <li>Input resistance (4 mA to 20 mA)</li> </ul>	100 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
• Input resistance (Pt 100)	10 ΜΩ
Input ranges (rated values), resistors	
No-load voltage, typ.	3.3 V
<ul> <li>Measuring current, typ.</li> </ul>	1,25 mA
• 0 to 600 ohms	Yes
<ul><li>Input resistance (0 to 600 ohms)</li></ul>	10 ΜΩ
Thermocouple (TC)	
Temperature compensation	

— parameterizable	No
Characteristic linearization	
parameterizable	Yes; by software
for resistance thermometer	Pt 100
Cable length	
• shielded, max.	100 m
Analog outputs	
Number of analog outputs	2
integrated channels (AO)	2
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	55 mA
Current output, no-load voltage, max.	14 V
Output ranges, voltage	Yes
• 0 to 10 V	Yes
• -10 V to +10 V	res
Output ranges, current	Voc
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	M. Mari
<ul> <li>for voltage output two-wire connection</li> </ul>	Yes; Without compensation of the line resistances
<ul> <li>for voltage output four-wire connection</li> </ul>	No
for current output two-wire connection	Yes
Load impedance (in rated range of output)	
<ul><li>with voltage outputs, min.</li></ul>	1 kΩ
<ul> <li>with voltage outputs, capacitive load, max.</li> </ul>	0.1 μF
<ul><li>with current outputs, max.</li></ul>	$300~\Omega$
<ul><li>with current outputs, inductive load, max.</li></ul>	0.1 mH
Destruction limits against externally applied voltages an	d currents
<ul> <li>Voltages at the outputs towards MANA</li> </ul>	16 V; Permanent
<ul><li>Current, max.</li></ul>	50 mA; Permanent
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	
Measurement principle	Actual value encryption (successive approximation)
Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	12 bit
• Integration time, parameterizable	Yes; 16.6 / 20 ms
<ul> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	50 / 60 Hz
<ul> <li>permissible input frequency, max.</li> </ul>	400 Hz

Time constant of the input filter	0.38 ms
Basic execution time of the module (all	1 ms
channels released)	

Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
<ul> <li>Resolution with overrange (bit including sign),</li> </ul>	12 bit
max.	
<ul><li>Conversion time (per channel)</li></ul>	1 ms
Settling time	
for resistive load	0.6 ms
• for capacitive load	1 ms
• for inductive load	0.5 ms

● for inductive load	0.5 ms
Encoder	
Connection of signal encoders	
<ul> <li>for voltage measurement</li> </ul>	Yes
• for current measurement as 2-wire transducer	Yes; with external supply
• for current measurement as 4-wire transducer	Yes
<ul> <li>for resistance measurement with two-wire connection</li> </ul>	Yes; Without compensation of the line resistances
<ul> <li>for resistance measurement with three-wire connection</li> </ul>	No
<ul> <li>for resistance measurement with four-wire connection</li> </ul>	No
Connectable encoders	
• 2-wire sensor	Yes
<ul> <li>permissible quiescent current (2-wire sensor), max.</li> </ul>	1.5 mA

Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.006 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.06 %
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.1 %
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.06 %
Operational error limit in overall temperature range	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	1 %
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	1 %

<ul> <li>Resistance, relative to input range, (+/-)</li> </ul>	1 %
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	1 %
<ul> <li>Current, relative to output range, (+/-)</li> </ul>	1 %
Basic error limit (operational limit at 25 °C)	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.8 %; Linearity error +/- 0.06 %
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	0.8 %; Linearity error +/- 0.06 %
<ul> <li>Resistance, relative to input range, (+/-)</li> </ul>	0.8 %; Linearity error +/- 0.2%
<ul> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	0.8 %
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	0.8 %
<ul> <li>Current, relative to output range, (+/-)</li> </ul>	0.8 %
Interference voltage suppression for f = n x (f1 +/- 1 %),	f1 = interference frequency
<ul> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> </ul>	30 dB
<ul> <li>Common mode interference, min.</li> </ul>	40 dB
Interfaces	
THE PROPERTY OF THE PROPERTY O	
Number of industrial Ethernet interfaces	1; 2 ports (switch) RJ45
	1; 2 ports (switch) RJ45 1; Combined MPI / PROFIBUS DP
Number of industrial Ethernet interfaces	
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces	1; Combined MPI / PROFIBUS DP
Number of industrial Ethernet interfaces  Number of RS 485 interfaces	1; Combined MPI / PROFIBUS DP
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface	1; Combined MPI / PROFIBUS DP 0
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type Physics	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485
Number of industrial Ethernet interfaces Number of RS 485 interfaces Number of RS 422 interfaces  1. Interface Interface type Physics Isolated	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes
Number of industrial Ethernet interfaces Number of RS 485 interfaces Number of RS 422 interfaces  1. Interface Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.  Functionality	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes 200 mA
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.  Functionality  • MPI	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes 200 mA
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.  Functionality  • MPI • PROFIBUS DP master	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes 200 mA  Yes Yes
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.  Functionality  • MPI • PROFIBUS DP master • PROFIBUS DP slave	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes 200 mA  Yes Yes Yes
Number of industrial Ethernet interfaces  Number of RS 485 interfaces  Number of RS 422 interfaces  1. Interface Interface type Physics Isolated Power supply to interface (15 to 30 V DC), max.  Functionality  • MPI  • PROFIBUS DP master  • PROFIBUS DP slave  • Point-to-point connection	1; Combined MPI / PROFIBUS DP 0 Integrated RS 485 interface RS 485 Yes 200 mA  Yes Yes Yes

Yes Yes

Yes Yes

Yes

12 Mbit/s

DP master

— PG/OP communication

— Global data communication

— S7 communication, as client

- S7 communication, as server

• Transmission rate, max.

S7 basic communicationS7 communication

— Routing

No; but via CP and loadable FB

<ul> <li>Number of DP slaves, max.</li> </ul>	124
Services	
— PG/OP communication	Yes
— Routing	Yes
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	Yes; I blocks only
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	No
<ul> <li>S7 communication, as server</li> </ul>	Yes
— Equidistance	Yes
— Isochronous mode	No
— SYNC/FREEZE	Yes
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes
<ul> <li>Number of DP slaves that can be</li> </ul>	8
simultaneously activated/deactivated, max.	
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	Yes; As subscriber
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
DP slave	
<ul><li>Transmission rate, max.</li></ul>	12 Mbit/s
automatic baud rate search	Yes; only with passive interface
<ul> <li>Address area, max.</li> </ul>	32
<ul> <li>User data per address area, max.</li> </ul>	32 byte
Services	
<ul> <li>PG/OP communication</li> </ul>	Yes
— Routing	Yes; Only with active interface
<ul> <li>Global data communication</li> </ul>	No
<ul><li>— S7 basic communication</li></ul>	No
— S7 communication	Yes
<ul> <li>S7 communication, as client</li> </ul>	No
<ul> <li>— S7 communication, as server</li> </ul>	Yes; Connection configured on one side only
<ul> <li>— Direct data exchange (slave-to-slave communication)</li> </ul>	Yes
— DPV1	No
Transfer memory	
— Inputs	244 byte

Interface type	— Outputs	244 byte
Ethernet RJ45	2. Interface	
Isolated Yes automatic detection of transmission rate Yes; 10/100 Mbit/s Autorogotiation Yes Autocrossing Yes Change of IP address at runtime, supported Yes Interface types  • Number of ports 2 • integrated switch Yes Media redundancy • supported Yes Switchover time on line break, typ. • Number of stations in the ring, max.  Functionality  • MPI No • PROFINET IO Controller Yes; Also simultaneously with IO-Device functionality • PROFINET IO Device Yes; Also simultaneously with IO Controller functionality • PROFINET BA Yes • PROFIBUS DP master No • PROFIBUS DP slave No • Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP • Web server Yes — Number of HTTP clients  PROFINET IO Controller • Transmission rate, max.  Services  — PG/OP communication Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32 — Isochronous mode Yes; Via TCP/IP, ISO on TCP, and UDP • Ves; OB 61 — Open IE communication Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32  - Isochronous mode Yes; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves; Via TCP/IP, ISO on TCP, and UDP • Ves • Prioritized startup	Interface type	PROFINET
automatic detection of transmission rate  Autoregoliation  Autoreossing  Autoreossing  Yes  Change of IP address at runtime, supported  Yes  Interface types  Number of ports  integrated switch  Yes  Media redundancy  supported  Switchover time on line break, typ. Number of stations in the ring, max.  Functionality  MPI  PROFINET IO Controller  PROFINET IO Device  PROFIBUS DP master  PROFIBUS DP slave  PROFIBUS DP slave  Open IE communication  Web server  Number of HTTP clients  PROFINET IO Controller  Transmission rate, max.  Services  PGOP communication  PSOPOP communication  Yes  Ves  Ves  Ves  No  No  No  No  PROFINET IO Controller  Yes  Ves  Ves  Ves  No  Open IE communication  Yes  PROFINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes  PSOPOP communication  Yes  Ves  Ves  No  No  POPOI Detection in the ring, max.  Ves  PROFINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes  Ves  PGOP communication  Yes  Yes  PSOPINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes  Yes  PSOPINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes  Yes  PSOPINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes  Yes  Yes  Ves  Open IE communication  Yes  Yes  Ves  Ves  Open IE communication  Yes  Yes  Ves  Ves  Open IE communication  Yes  Yes  Ves  Ves  Ves  Ves  Ves  Open IE communication  Yes  Yes  Ves  Ves  Ves  Open IE communication  Yes  Yes  Ves  Ves  Ves  No  Open IE communication  Yes  Yes  Ves  Ves  No  Open IE communication  Yes  Yes  Ves  No  Open IE communication  Yes  Yes  Ves  No  Open IE communication  Yes  PROFINET MRP  Open IE  Open I	Physics	Ethernet RJ45
Autorossing Yes Change of IP address at runtime, supported Yes Interface types  Number of ports integrated switch Yes  Media redundancy  supported Switchover time on line break, typ. Number of stations in the ring, max.  Functionality  MPI PROFINET IO Controller PROFINET IO Device PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server PROFINET IO Controller Transmission rate, max.  Services  PROFINET IO Communication PROFINET IO Controller Yes: Via TCP/IP, ISO on TCP, and UDP PROFINET OB Transmission rate, max.  Services PROFINET IO Controller PROFINET OB Transmission rate, max.  Services PROFINET OB Transmission rate, max.  Services PROFINET OB Transmission rate, max.  Services PROFINET OB Controller Transmission rate, max.  Services PROFINET OB Communication Pes: With loadable FBs, max. configurable connections: 10, max. number of instances: 32 Yes: OB 61 Yes: OB 61 Yes: Via TCP/IP, ISO on TCP, and UDP Yes Shared device Prioritized startup Yes	Isolated	Yes
Autocrossing Change of IP address at runtime, supported Ves Interface types  • Number of ports • integrated switch  Media redundancy • supported • Switchover time on line break, typ. • Number of stations in the ring, max.  Functionality • MPI • PROFINET IO Controller • PROFINET IO Device • PROFINET OB Paster • PROFIBUS DP master • PROFIBUS DP master • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Web server — Number of HTTP clients  PROFINET IO Controller • Transmission rate, max.  Services  PROFINET IO Controller • Transmission rate, max.  Ioo Mbit/s  Services  Psochone Communication  Yes  Profice Communication  Psochone  Profice Communication  Yes  Profice Communication  Yes  Profice Communication  Psochone  Profice Communication  P	automatic detection of transmission rate	Yes; 10/100 Mbit/s
Charge of IP address at runtime, supported  Interface types  Number of ports integrated switch  Media redundancy  supported Switchover time on line break, typ. Number of stations in the ring, max.  Functionality  MPI PROFINET IO Controller PROFINET IO Device PROFIBUS DP master PROFIBUS DP master PROFIBUS DP slave Open IE communication Web server PROFINET IO Controller Transmission rate, max.  Services  PROFINET IO Controller Transmission rate, max.  Services  PROFINET IO Controller Propen IE communication	Autonegotiation	Yes
Interface types  • Number of ports • integrated switch  Media redundancy • supported • Switchover time on line break, typ. • Number of stations in the ring, max.  Functionality • MPI • PROFINET IO Controller • PROFINET IO Device • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication • Routing • Transmission rate, max.  100 Mbit/s  Services  — PG/OP communication — Routing — S7 communication — Isochronous mode — Open IE communication — IRT — Shared device — Prioritized startup  Yes  2   Yes  2   Yes  2   Yes  2   Yes  200 ms; PROFINET MRP  Yes  50  No  No  No  Yes; Also simultaneously with IO-Device functionality  Yes; Also simultaneously with IO Controller functionality  Yes  Yes  Yes  Yes  No  No  Yes  Yes  100 Mbit/s  No  Yes  Yes  - Soand UDP  Yes  - Soand UDP  Yes  Yes  - PG/OP communication  Yes  Yes  - PG/OP communication  Yes  Yes  - Soand UDP  Yes  - Prioritized startup  Yes	Autocrossing	Yes
Number of ports integrated switch  Media redundancy  supported Switchover time on line break, typ. Number of stations in the ring, max.  Functionality  MPI PROFINET IO Controller PROFIBUS DP slave PROFIBUS DP slave No Open IE communication Transmission rate, max.  PROFINET IO Controller Transmission rate, max.  PROFINET IO Controller Transmission rate, max.  Services  PG/OP communication Psort was a configurable connections: 10, max. number of instances: 32 Pshared device Profile Communication Psis Vis TCP/IP, ISO on TCP, and UDP Yes Ves No PROFINET IO Controller Profiler Communication P	Change of IP address at runtime, supported	Yes
integrated switch  Media redundancy  supported Switchover time on line break, typ. Number of stations in the ring, max.  Functionality  MPI PROFINET IO Controller PROFINET OBA PROFISUS DP slave Open IE communication Transmission rate, max.  PROFINET IO Controller  Transmission rate, max.  PROFINET IO Controller Transmission rate, max.  Services  PROFOP communication PROFINET IO Controller PROFINET IO Controller Transmission rate, max.  Services  PROFOP communication PROFINET IO Controller PROFINET IO Controller PROFINET IO Controller Transmission rate, max.  Services  PROFOP communication Pes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32 Pes; With Ioadable FBs, max. configurable connections: 10, max. number of instances: 32 Pes; OB 61 Popen IE communication Pes; Via TCP/IP, ISO on TCP, and UDP Pes; Via TCP/IP, ISO on TCP, and UDP Pes; With Ioadable FBs, max. configurable connections: 10, max. number of instances: 32 Pes; OB 61 Pes; Via TCP/IP, ISO on TCP, and UDP Perioritized startup Pes	Interface types	
Media redundancy  • supported • Switchover time on line break, typ. • Number of stations in the ring, max.  Functionality  • MPI • PROFINET IO Controller • PROFIBUS DP master • PROFIBUS DP slave • Open IE communication - Routing - S7 communication - IRT - Shared device - Prioritized startup  • Switchover time on line break, typ. 200 ms; PROFINET MRP  200 ms; PROFINET MRP 200 ms; PROFINET MRP 200 ms; PROFINET MRP 200 ms; PROFINET MRP 200 ms; PROFINET MRP 200 ms; PROFINET MRP 200 ms; PROFINET MRP 200 ms; PROFINET IO Controller 4 yes; Also simultaneously with IO-Device functionality 4 yes; Via TCP/IP, ISO on TCP, and UDP 4 yes 4 PROFIBED SD PROFINET MRP 5 PROFINET IO Controller  • Transmission rate, max.  100 Mbit/s  Services  - PG/OP communication - Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32 - Isochronous mode - Yes; OB 61 - Open IE communication - IRT - Shared device - Prioritized startup  Yes	<ul><li>Number of ports</li></ul>	2
supported     Switchover time on line break, typ.     Number of stations in the ring, max.  Functionality      MPI     No     PROFINET IO Controller     PROFINET O Device     PROFIBUS DP master     No     PROFIBUS DP slave     No     Open IE communication     Transmission rate, max.  Services  PG/OP communication PG/OP	• integrated switch	Yes
Switchover time on line break, typ. Switchover time on line break, typ. Number of stations in the ring, max.  Functionality  MPI PROFINET IO Controller Yes; Also simultaneously with IO-Device functionality PROFINET IO Device Yes; Also simultaneously with IO Controller functionality PROFINET CBA PROFIBUS DP master PROFIBUS DP slave PROFIBUS DP slave Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP Web server Number of HTTP clients PROFINET IO Controller Transmission rate, max. 100 Mbit/s  Services PG/OP communication Yes PS7 communication Yes Significant of the properties of the sum of the properties of the	Media redundancy	
Number of stations in the ring, max.  Functionality      MPI     No     PROFINET IO Controller     Yes; Also simultaneously with IO-Device functionality     PROFINET IO Device     Yes; Also simultaneously with IO Controller functionality     PROFINET CBA     Yes     PROFIBUS DP master     No     PROFIBUS DP slave     Open IE communication     Yes; Via TCP/IP, ISO on TCP, and UDP  Web server     Number of HTTP clients  PROFINET IO Controller      Transmission rate, max.  PG/OP communication     Yes     Routing     Yes     Services  PG/OP communication     Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32     No     Services  PGPOP IE communication     Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32     No     Services     Popen IE communication     Yes; Via TCP/IP, ISO on TCP, and UDP     IRT     Shared device     Prioritized startup     Yes	• supported	Yes
Functionality  • MPI  • PROFINET IO Controller  • PROFINET IO Device  • PROFINET OBA  • PROFIBUS DP master  • PROFIBUS DP slave  • Open IE communication  • Transmission rate, max.  PROFINET IO Controller  • Transmission rate, max.  PROFOP Communication  PROFIDE OBA  • PROFIDE OBA  • PROFINET OBA  • PROFINET IO Controller  • Transmission rate, max.  PROFINET IO Controller  • Transmission rate, max.  PROFIDE OBA  • PROFIDE O	<ul> <li>Switchover time on line break, typ.</li> </ul>	200 ms; PROFINET MRP
MPI PROFINET IO Controller PROFINET IO Device PROFINET IO Device PROFINET CBA PROFINET CBA PROFIBUS DP master PROFIBUS DP slave PROFIBUS DP slave PROFINET IO Controller PROFIBUS DP Slave PROFIBUS DP Slave PROFINET IO Communication PROFINET IO Controller Transmission rate, max.  Services PROFIOP communication Pes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32 Psi Substances: 32 Psi Subst	<ul> <li>Number of stations in the ring, max.</li> </ul>	50
PROFINET IO Controller PROFINET IO Device PROFINET CBA PROFIBUS DP master PROFIBUS DP slave Open IE communication Transmission rate, max.  PROFIDET IO Controller PROFIDET IO Controller PROFINET IO Controller PROFIDET IO Controller Transmission rate, max.  Services  PROFIDE Services PROFIDE Communication Yes PROFIDE IO Controller PROFIDE IO Communication Yes PROFIDE IO Communication IN COMMUNICATION	Functionality	
<ul> <li>PROFINET IO Device</li> <li>PROFINET CBA</li> <li>PROFIBUS DP master</li> <li>PROFIBUS DP slave</li> <li>Open IE communication</li> <li>Web server</li> <li>No</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>PROFIDE Communication</li> <li>Yes</li> <li>PROFIDE TIO Controller</li> <li>Transmission rate, max.</li> <li>PROFIDE Communication</li> <li>Yes</li> <li>PROFIDE Communication</li> <li>Yes</li> <li>PSOFOR communication</li> <li>PSOFOR communication</li> <li>Yes</li> <li>No</li> <li>Yes</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>100 Mbit/s</li> <li>Services</li> <li>PROFIDE TIO Controller</li> <li>Transmission rate, max.</li> <li>100 Mbit/s</li> <li>Services</li> <li>PG/OP communication</li> <li>Yes</li> <li>No</li> <li>No</li> <li>TCP, and UDP</li> <li>Yes</li> <li>Prioritized startup</li> <li>Yes</li> <li>Prioritized startup</li> </ul>	• MPI	No
<ul> <li>PROFINET CBA</li> <li>PROFIBUS DP master</li> <li>No</li> <li>PROFIBUS DP slave</li> <li>Open IE communication</li> <li>Web server</li> <li>No</li> <li>Web server</li> <li>No</li> <li>Web server</li> <li>No</li> <li>Transmission rate, max.</li> <li>PROFINET IO Controller</li> <li>Transmission rate, max.</li> <li>Services</li> <li>PG/OP communication</li> <li>Routing</li> <li>S7 communication</li> <li>Yes</li> <li>S7 communication</li> <li>Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>Isochronous mode</li> <li>Open IE communication</li> <li>Yes; Via TCP/IP, ISO on TCP, and UDP</li> <li>IRT</li> <li>Shared device</li> <li>Prioritized startup</li> <li>Yes</li> </ul>	<ul> <li>PROFINET IO Controller</li> </ul>	Yes; Also simultaneously with IO-Device functionality
PROFIBUS DP master PROFIBUS DP slave PROFIBUS DP slave Open IE communication Web server Number of HTTP clients  PROFINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PG/OP communication Yes Routing S7 communication Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32  I sochronous mode Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP  IRT Shared device Prioritized startup Yes	PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
PROFIBUS DP slave Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP Web server Number of HTTP clients  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: 10, max. number of instances: 32  I sochronous mode Yes; OB 61 Open IE communication Yes Yes Shared device Prioritized startup Yes	PROFINET CBA	Yes
Open IE communication     Yes; Via TCP/IP, ISO on TCP, and UDP     Web server     Number of HTTP clients     Services  PROFINET IO Controller      Transmission rate, max.  100 Mbit/s  Services  PG/OP communication Pession Routing Yes S7 communication Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32  Isochronous mode Yes; OB 61 Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP IRT Shared device Prioritized startup Yes	PROFIBUS DP master	No
Web server  Number of HTTP clients  PROFINET IO Controller  Transmission rate, max.  100 Mbit/s  Services  PG/OP communication  Routing  S7 communication  Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32  Isochronous mode  Open IE communication  Pes; Via TCP/IP, ISO on TCP, and UDP  IRT  Shared device  Prioritized startup  Yes	PROFIBUS DP slave	No
<ul> <li>Number of HTTP clients</li> <li>PROFINET IO Controller</li> <li>◆ Transmission rate, max.</li> <li>100 Mbit/s</li> <li>Services</li> <li>— PG/OP communication</li> <li>— Routing</li> <li>— S7 communication</li> <li>— Yes</li> <li>— S7 communication</li> <li>— Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>— Isochronous mode</li> <li>— Open IE communication</li> <li>— Ves; OB 61</li> <li>— Open IE communication</li> <li>— IRT</li> <li>— Shared device</li> <li>— Prioritized startup</li> <li>Yes</li> </ul>	Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
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: 10, max. number of instances: 32  — Isochronous mode Yes; OB 61 — Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP — IRT Yes — Shared device Yes — Prioritized startup Yes	Web server	Yes
● Transmission rate, max.  Services  - PG/OP communication - Routing - S7 communication - S7 communication - Isochronous mode - Open IE communication - IRT - Shared device - Prioritized startup  100 Mbit/s  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Y	<ul> <li>Number of HTTP clients</li> </ul>	5
Services  - PG/OP communication Yes - Routing Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32 - Isochronous mode Yes; OB 61 - Open IE communication Yes; Via TCP/IP, ISO on TCP, and UDP - IRT Yes - Shared device Yes - Prioritized startup Yes	PROFINET IO Controller	
<ul> <li>— PG/OP communication</li> <li>— Routing</li> <li>— S7 communication</li> <li>— Ves; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>— Isochronous mode</li> <li>— Open IE communication</li> <li>— IRT</li> <li>— Shared device</li> <li>— Prioritized startup</li> <li>Yes</li> </ul>	Transmission rate, max.	100 Mbit/s
<ul> <li>Routing</li> <li>S7 communication</li> <li>Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>Isochronous mode</li> <li>Open IE communication</li> <li>IRT</li> <li>Shared device</li> <li>Prioritized startup</li> </ul> Yes Yes Yes Yes Yes Yes	Services	
<ul> <li>Routing</li> <li>S7 communication</li> <li>Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>Isochronous mode</li> <li>Open IE communication</li> <li>IRT</li> <li>Shared device</li> <li>Prioritized startup</li> </ul> Yes Yes Yes Yes Yes Yes	— PG/OP communication	Yes
<ul> <li>— S7 communication</li> <li>— Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>— Isochronous mode</li> <li>— Open IE communication</li> <li>— IRT</li> <li>— Shared device</li> <li>— Prioritized startup</li> <li>Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32</li> <li>Yes; OB 61</li> <li>Yes; Via TCP/IP, ISO on TCP, and UDP</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>		Yes
<ul> <li>Open IE communication</li> <li>IRT</li> <li>Shared device</li> <li>Prioritized startup</li> <li>Yes; Via TCP/IP, ISO on TCP, and UDP</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>		
<ul> <li>— IRT</li> <li>— Shared device</li> <li>— Prioritized startup</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>	— Isochronous mode	Yes; OB 61
<ul><li>— Shared device</li><li>— Prioritized startup</li><li>Yes</li></ul>	— Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
— Prioritized startup Yes	— IRT	Yes
— Prioritized startup Yes	— Shared device	Yes
		Yes
startup, max.	<ul> <li>Number of IO devices with prioritized</li> </ul>	32
— Number of connectable IO Devices, max. 128	— Number of connectable IO Devices, max.	128
— Of which IO devices with IRT, max.	— Of which IO devices with IRT, max.	64

— of which in line, max.	64
<ul> <li>Number of IO Devices with IRT and the</li> </ul>	128
option "high flexibility"	
— of which in line, max.	61
<ul> <li>Number of connectable IO Devices for RT,</li> </ul>	128
max.	
— of which in line, max.	128
<ul> <li>Activation/deactivation of IO Devices</li> </ul>	Yes
<ul> <li>Number of IO Devices that can be</li> </ul>	8
simultaneously activated/deactivated, max.	v.
<ul> <li>IO Devices changing during operation (partner ports), supported</li> </ul>	Yes
<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8
<ul> <li>Device replacement without swap medium</li> </ul>	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.	2 kbyte
— Outputs, max.	2 kbyte
<ul> <li>User data consistency, max.</li> </ul>	1 024 byte
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32
— Isochronous mode	No
<ul> <li>Open IE communication</li> </ul>	Yes; Via TCP/IP, ISO on TCP, and UDP
— IRT	Yes
— PROFlenergy	Yes; With SFB 73 / 74 prepared for loadable PROFlenergy standard FB for I-Device
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	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

DDOFINET OD A	
PROFINET CBA	Van
acyclic transmission	Yes
cyclic transmission	Yes
Open IE communication	
<ul> <li>Number of connections, max.</li> </ul>	8
<ul> <li>Local port numbers used at the system end</li> </ul>	0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535
<ul> <li>Keep-alive function, supported</li> </ul>	Yes
Isochronous mode	
Isochronous operation (application synchronized up	Yes; For PROFINET only
to terminal)	
Communication functions	
PG/OP communication	Yes
Data record routing	Yes
Global data communication	
• supported	Yes
<ul> <li>Number of GD loops, max.</li> </ul>	8
<ul> <li>Number of GD packets, max.</li> </ul>	8
<ul> <li>Number of GD packets, transmitter, max.</li> </ul>	8
<ul> <li>Number of GD packets, receiver, max.</li> </ul>	8
Size of GD packets, max.	22 byte
• Size of GD packet (of which consistent), max.	22 byte
S7 basic communication	
• supported	Yes
<ul> <li>User data per job, max.</li> </ul>	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
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
<ul><li>Number of connections, max.</li></ul>	8
<ul> <li>Data length for connection type 01H, max.</li> </ul>	1 460 byte
<ul> <li>Data length for connection type 11H, max.</li> </ul>	32 768 byte

<ul> <li>several passive connections per port,</li> <li>supported</li> </ul>	Yes
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	8
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	8
— Data length, max.	1 472 byte
Web server	
• supported	Yes
Number of HTTP clients	5
<ul> <li>User-defined websites</li> </ul>	Yes
PROFINET CBA (at set setpoint communication load)	
Setpoint for the CPU communication load	50 %
<ul> <li>Number of remote interconnection partners</li> </ul>	32
<ul> <li>Number of functions, master/slave</li> </ul>	30
<ul> <li>Total of all master/slave connections</li> </ul>	1 000
<ul> <li>Data length of all incoming connections master/slave, max.</li> </ul>	4 000 byte
<ul> <li>Data length of all outgoing connections master/slave, max.</li> </ul>	4 000 byte
<ul> <li>Number of device-internal and PROFIBUS interconnections</li> </ul>	500
<ul> <li>Data length of device-internal und PROFIBUS interconnections, max.</li> </ul>	4 000 byte
<ul> <li>Data length per connection, max.</li> </ul>	1 400 byte
Remote interconnections with acyclic transmission	
— Sampling frequency: Sampling time, min.	500 ms
<ul> <li>Number of incoming interconnections</li> </ul>	100
<ul> <li>Number of outgoing interconnections</li> </ul>	100
<ul> <li>Data length of all incoming interconnections, max.</li> </ul>	2 000 byte
<ul> <li>Data length of all outgoing interconnections, max.</li> </ul>	2 000 byte
<ul> <li>Data length per connection, max.</li> </ul>	1 400 byte
Remote interconnections with cyclic transmission	
<ul> <li>Transmission frequency: Transmission interval, min.</li> </ul>	10 ms
<ul> <li>Number of incoming interconnections</li> </ul>	200
<ul> <li>Number of outgoing interconnections</li> </ul>	200
<ul> <li>Data length of all incoming</li> </ul>	2 000 byte
interconnections, max.	

— Data length of all outgoing	2 000 byte
interconnections, max.	450 byte
— Data length per connection, max.	450 Dyte
HMI variables via PROFINET (acyclic)	2: 2: DN ODOM: iMars
<ul> <li>Number of stations that can log on for HMI variables (PN OPC/iMap)</li> </ul>	3; 2x PN OPC/1x iMap
<ul> <li>HMI variable updating</li> </ul>	500 ms
<ul> <li>Number of HMI variables</li> </ul>	200
<ul> <li>Data length of all HMI variables, max.</li> </ul>	2 000 byte
PROFIBUS proxy functionality	
— supported	Yes
<ul> <li>Number of linked PROFIBUS devices</li> </ul>	16
<ul> <li>Data length per connection, max.</li> </ul>	240 byte; Slave-dependent
Number of connections	
• overall	12
<ul> <li>usable for PG communication</li> </ul>	11
<ul> <li>reserved for PG communication</li> </ul>	1
<ul> <li>adjustable for PG communication, min.</li> </ul>	1
<ul> <li>adjustable for PG communication, max.</li> </ul>	11
<ul> <li>usable for OP communication</li> </ul>	11
<ul> <li>reserved for OP communication</li> </ul>	1
— adjustable for OP communication, min.	1
— adjustable for OP communication, max.	11
<ul> <li>usable for S7 basic communication</li> </ul>	8
<ul> <li>reserved for S7 basic communication</li> </ul>	0
<ul> <li>adjustable for S7 basic communication,</li> </ul>	0
min.	
<ul> <li>adjustable for S7 basic communication,</li> </ul>	8
max.	
<ul> <li>usable for S7 communication</li> </ul>	10
<ul> <li>reserved for S7 communication</li> </ul>	0
<ul><li>— adjustable for S7 communication, min.</li></ul>	0
<ul><li>— adjustable for S7 communication, max.</li></ul>	10
<ul><li>total number of instances, max.</li></ul>	32
usable for routing	X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max.
S7 message functions	
Number of login stations for message functions, max.	12; 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	

Single step Number of breakpoints Status/control Status/control variable Status/control variables Status/control variables Status/control variables Status/control variables Status/control variables Status/control variables, max. Superior of which status variables, max. Superior of which control variables, max. Superior of variables Superior of variables, max. Superior of variables. Superior of variable	Status block	Yes; Up to 2 simultaneously
Number of breakpoints  Status/control variable  Status/control variable  Number of variables, max.  of which control variables, max.  Frequency measurement  Status of breakpoints  A status variables, max.  of which control variables, max.  Frequency measurement  Number of denuters  Status indicator digital input (green)  Status indicator digital output (green)  Status indicator greatened  Ves  Ves  A see "Technological Functions" manual)  PID controller  Yes  Ves  Ves  A see "Technological Functions" manual)  PID controller  Ves  Number of pulse outputs  A sep PiD controller  Ves  Status indicator blocks (closed-loop control)  PID controller  Ves  Number of pulse outputs  Ves  To Blagonatics (closed-loop control)  Ves  Number of frequency meters  controlled positioning  Ves  Number of pulse outputs  Ves  Number of pulse outputs  Limit frequency (pulse)  Zo Extential separation  Potential separation  Potential separation digital inputs		
Status/control variable  • Variables  • Variables, max.  — of which status variables, max.  — of which control variables, max.  • Forcing  • Forcing  • Forcing, variables  • Number of variables, max.  10  Diagnostic buffer  • present  • Number of entries, max.  — adjustable  — of which powerfail-proof  • Number of entries readable in RUN, max.  — acan be set  — preset  • ves: From 10 to 499  — preset  • Can be read out  Service data  • can be read out  • Status indicator digital input (green)  • Status indicator digital input (green)  • Status indicator digital input (green)  • Status indicator digital output (green)  • Status indicator digital input (green)  • Yes  Number of frequency (counter) max.  Frequency measurement  Yes  Number of frequency (counter) max.  Frequency measurement  Yes  Number of frequency (counter) max.  Frequency measurement  Yes  Number of pulse outputs  4; Pel Doontroller (see "Technological Functions" manual)  Potential separation  Potential separation  Potential separation digital inputs		4
Number of variables, max.  of which status variables, max.  of which control variables, max.  of which control variables, max.  of which control variables, max.  Forcing  Forcing  Forcing  Forcing, variables  Number of variables, max.  10   Diagnostic buffer  present  Number of entries, max.  of which powerfail-proof  Number of entries readable in RUN, max.  — adjustable — of which powerfail-proof  Number of entries readable in RUN, max. — can be set — preset  can be read out  Service data  can be read out  Service data  can be read out  Nes  Nes  Nes  Nes  Nes  Nes  Nes  Ne	·	
Number of variables, max.  — of which status variables, max.  — of which control variables, max.  14  Forcing  • Forcing  • Forcing, variables  • Number of variables, max.  10  Diagnostic buffer  • present  • Number of entries, max.  — adjustable — of which powerfail-proof  • Number of entries readable in RUN, max. — are be set — preset — preset — preset — preset — or an be read out  Service data  • can be read out  * Status indicator digital input (green) — \$ Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator gital output (green)  • Status indicator gital output (green)  • Status indicator founders  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  Countroller of pulse outputs  Number of pulse outputs  Ves "Technological Functions" manual)  Polo controller  Ves  Polo controller  Ves  Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Functions Manual)  Limit frequency (pulse)  Polential separation  Potential separation  Potential separation	Status/control variable	Yes
- of which status variables, max of which control variables, max of which control variables, max of which control variables, max.  - Forcing - Forcing - Forcing - Forcing - Forcing - Forcing, variables - Number of variables, max.  Diagnostic buffer - present - present - ves - adjustable - of which powerfail-proof - Number of entries readable in RUN, max can be set - preset - preset - ves; From 10 to 499 - preset - ves; From 10 to 499 - preset - ves; From 10 to 499	Variables	Inputs, outputs, memory bits, DB, times, counters
- of which status variables, max.   - of which control variables, max.   - of which control variables, max.  Forcing  Forcing  Forcing, variables  Forcing  For	Number of variables, max.	
- of which control variables, max.  Forcing  Forcing Forcing, variables Forcing, variables Forcing, variables Forcing, variables, max.  Diagnostic buffer  Present Pre		30
Forcing Forcing, variables Forcing For		
Forcing, variables Forcing Forcing Forcing Forcing Forcing Forcing, variables Forcing Forcing Forcing Forcing Forcing Forcing, variables Forcing Forcing Forcing Forcing Forcing Forcing, variables Forcing, variables Forcing Forcing Forcing, variables Forcing Forcing, variables Forcing Forcing Forcing Forcing Forcing, variables Forcing Forcin	·	
Forcing, variables Number of variables, max.  Diagnostic buffer   Present Pre		Yes
Number of variables, max.  Diagnostic buffer  present  present  present  number of entries, max.  adjustable  of which powerfail-proof  Number of entries readable in RUN, max.  - and justable  or which powerfail-proof  Number of entries readable in RUN, max.  - can be set  preset  10  Service data  can be read out  Yes  returnuts/diagnostics/status information  Diagnostics indication LED  status indicator digital input (green)  status indicator digital output (green)  Yes  Number of counters  Aumber of counters  Aumber of frequency (counter) max.  Frequency measurement  Number of frequency meters  A; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  Number of pulse outputs  A; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  2.5 kHz	-	Inputs, outputs
Diagnostic buffer  • present • Number of entries, max. — adjustable — of which powerfail-proof • Number of entries readable in RUN, max. — can be set — preset  • can be read out • can be read out  returnuts/diagnostics/status information  Diagnostics indicator digital input (green) • Status indicator digital output (green) • Status indicator digital input (green) • Status indicator digital output (green) • Status indicator digital input (green) • Status indicator digital input (green) • Status indicator digital output (green) • Status indicator digital input (green) • Status indicator digital input (green) • Status indicator digital output (green) • Status indicator digital input (	-	
Present  Present  Number of entries, max.  Adjustable  Of which powerfail-proof  Number of entries readable in RUN, max.  Can be set  Preset		
Number of entries, max.  — adjustable — of which powerfail-proof 100; Only the last 100 entries are retained  Number of entries readable in RUN, max. — can be set — preset 10  Service data  • can be read out Yes  Interrupts/diagnostics/status information  Diagnostics indication LED  • Status indicator digital input (green) • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital input (green)  • Status indicator digital		Yes
adjustable of which powerfail-proof Number of entries readable in RUN, max can be set preset preset preset preset preset preset preset preset preset can be read out preset	•	
of which powerfail-proof  Number of entries readable in RUN, max.  — can be set — preset  10  Service data  • can be read out  Yes  Interrupts/diagnostics/status information  Diagnostics indication LED  • Status indicator digital input (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  • Status indicator digital output (green)  * See "Technological Functions" manual  Counting frequency (counter) max.  * Go kHz  Frequency measurement  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  Yes; PID controller (see "Technological Functions" manual)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  Limit frequency (pulse)  2.5 kHz  Potential separation  Potential separation digital inputs	·	
Number of entries readable in RUN, max. — can be set — preset  10  Service data  • can be read out  Yes  Interrupts/diagnostics/status information  Diagnostics indication LED  • Status indicator digital input (green) • Status indicator digital output (green)  • Status indicator digital output (green)  Ves  Integrated Functions  Number of counters  4; See "Technological Functions" manual  Counting frequency (counter) max.  60 kHz  Frequency measurement  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  PlD controller  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  2.5 kHz	•	
— can be set — preset  10  Service data  • can be read out  Yes  Interrupts/diagnostics/status information  Diagnostics indication LED  • Status indicator digital input (green) • Status indicator digital output (green)  • Status indicator digital output (green)  Number of counters  Ves  Ves  Integrated Functions  Number of counters  4; See "Technological Functions" manual  Counting frequency (counter) max.  60 kHz  Frequency measurement  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  PlD controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  2.5 kHz	·	
— preset  Service data  ■ can be read out  Yes  Interrupts/diagnostics/status information  Diagnostics indication LED  ■ Status indicator digital input (green)  ■ Status indicator digital output (green)  ■ Status indicator digital output (green)  Yes  Integrated Functions  Number of counters  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  4; See "Technological Functions" manual  Controlled positioning  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes; PID controller (see "Technological Functions" manual)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  Limit frequency (pulse)  2.5 kHz		
Service data  • can be read out  • can be read out  Yes  Interrupts/diagnostics/status information  Diagnostics indication LED  • Status indicator digital input (green)  • Status indicator digital output (green)  Yes  Integrated Functions  Number of counters  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  4; See "Technological Functions" manual  Controlled positioning  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  Potential separation  Potential separation  Potential separation digital inputs		
can be read out      Number of frequency meters     Integrated function blocks (closed-loop control) PID controller Number of pulse outputs  Integrated functions  Number of frequency (counter)  Number of frequency meters  A; up to 60 kHz (see "Technological Functions" manual)  Controlled positioning  Yes  Yes  Yes  Ves  A; up to 60 kHz (see "Technological Functions" manual)  Controlled positioning  Yes  Integrated function blocks (closed-loop control)  Yes; PID controller (see "Technological Functions" manual)  PID controller  Yes  Number of pulse outputs  A; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  2.5 kHz  Potential separation  Potential separation digital inputs	·	10
Interrupts/diagnostics/status information  Diagnostics indication LED  Status indicator digital input (green) Status indicator digital output (green)  Yes  Integrated Functions  Number of counters  Counting frequency (counter) max.  Frequency measurement Yes  Number of frequency meters 4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning Yes  Integrated function blocks (closed-loop control) Yes; PID controller (see "Technological Functions" manual)  PID controller  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  Limit frequency (pulse)  Potential separation Potential separation digital inputs		Vac
Diagnostics indication LED  ● Status indicator digital input (green)  ● Status indicator digital output (green)  Number of counters  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  A; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  integrated function blocks (closed-loop control)  PID controller  Number of pulse outputs  A; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  2.5 kHz  Potential separation  Potential separation digital inputs	Can be read out	163
Status indicator digital input (green)  Status indicator digital output (green)  Yes  Number of counters  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  Ves  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  Potential separation  Potential separation digital inputs	Interrupts/diagnostics/status information	
Status indicator digital output (green)  Number of counters  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  Ves  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  Potential separation  Potential separation digital inputs	Diagnostics indication LED	
Number of counters  A; See "Technological Functions" manual  Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  A; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  A; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  2.5 kHz  Potential separation  Potential separation digital inputs	<ul> <li>Status indicator digital input (green)</li> </ul>	Yes
Number of counters  4; See "Technological Functions" manual  Counting frequency (counter) max.  60 kHz  Frequency measurement  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  Potential separation  Potential separation digital inputs	<ul> <li>Status indicator digital output (green)</li> </ul>	Yes
Number of counters  4; See "Technological Functions" manual  Counting frequency (counter) max.  60 kHz  Frequency measurement  Yes  Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  controlled positioning  Yes  integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  Potential separation  Potential separation digital inputs	Integrated Functions	
Counting frequency (counter) max.  Frequency measurement  Number of frequency meters  controlled positioning  integrated function blocks (closed-loop control)  PID controller  Number of pulse outputs  A; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  Potential separation  Potential separation digital inputs		4; See "Technological Functions" manual
Number of frequency meters  4; up to 60 kHz (see "Technological Functions" manual)  Yes integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" manual)  Limit frequency (pulse)  2.5 kHz  Potential separation  Potential separation digital inputs	Counting frequency (counter) max.	
controlled positioning  integrated function blocks (closed-loop control)  PID controller  Yes  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  Limit frequency (pulse)  2.5 kHz  Potential separation  Potential separation digital inputs	Frequency measurement	Yes
integrated function blocks (closed-loop control)  PID controller  Number of pulse outputs  Limit frequency (pulse)  Yes; PID controller (see "Technological Functions" manual)  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  2.5 kHz  Potential separation  Potential separation digital inputs	Number of frequency meters	4; up to 60 kHz (see "Technological Functions" manual)
PID controller  Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  Limit frequency (pulse)  2.5 kHz  Potential separation  Potential separation digital inputs	controlled positioning	Yes
Number of pulse outputs  4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)  2.5 kHz  Potential separation  Potential separation digital inputs	integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)
Functions" Manual)  Limit frequency (pulse)  2.5 kHz  Potential separation  Potential separation digital inputs	PID controller	Yes
Potential separation Potential separation digital inputs	Number of pulse outputs	
Potential separation digital inputs	Limit frequency (pulse)	2.5 kHz
Potential separation digital inputs	Potential separation	
Potential separation digital inputs     Yes		
	Potential separation digital inputs	Yes

• between the channels	No
between the channels and backplane bus	Yes
Potential separation digital outputs	
Potential separation digital outputs	Yes
• between the channels	Yes
• between the channels, in groups of	8
between the channels and backplane bus	Yes
Potential separation analog inputs	
Potential separation analog inputs	Yes; common for analog I/O
• between the channels	No
• between the channels and backplane bus	Yes
Potential separation analog outputs	
Potential separation analog outputs	Yes; common for analog I/O
• between the channels	No
<ul> <li>between the channels and backplane bus</li> </ul>	Yes
Permissible potential difference	
Between the inputs and MANA (UCM)	8 V DC
1-1-6	
Isolation Isolation tested with	600 V DC
isolation tested with	000 V DG
Ambient conditions	
Ambient temperature during operation	2.00
• min.	0 °C
• max.	60 °C
Configuration	
Configuration software	
• STEP 7	Yes; V5.5 or higher
Programming	
Command set	see instruction list
<ul><li>Nesting levels</li></ul>	8
<ul><li>System functions (SFC)</li></ul>	see instruction list
<ul><li>System function blocks (SFB)</li></ul>	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.

730 g

last modified:

03/23/2017