

SIMATIC S7-300, CPU 314C-2PN/DP Compact CPU with 192 KB work memory, 24 DI/16 DO, 4 AI, 2 AO, 1 Pt100, 4 high-speed counters (60 kHz), 1st interface MPI/DP 12 Mbit/s, 2nd interface Ethernet PROFINET, with 2-port switch, Integr. power supply 24 V DC, Front connector (2x 40-pole) and Micro Memory Card required



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

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

• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	1 024; Number range: 0 to 7999
• Size, max.	64 kbyte
<b>OB</b>	
• Description	see instruction list
• 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
• 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; only for PROFINET
• 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
<b>Nesting depth</b>	
• per priority class	16
• additional within an error OB	4
<b>Counters, timers and their retentivity</b>	
<b>S7 counter</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
<b>Counting range</b>	
— adjustable	Yes
— lower limit	0
— upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>S7 times</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes

— lower limit	0
— upper limit	255
— preset	No retentivity
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
• Number	Unlimited (limited only by RAM capacity)
<b>Data areas and their retentivity</b>	
retentive data area in total	all, max. 64 KB
<b>Flag</b>	
• Number, max.	256 byte
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
<b>Data blocks</b>	
• Retentivity adjustable	Yes; via non-retain property on DB
• Retentivity preset	Yes
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
<b>Process image</b>	
• Inputs	2 048 byte
• Outputs	2 048 byte
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
• Inputs, default	256 byte
• Outputs, default	256 byte
<b>Default addresses of the integrated channels</b>	
— Digital inputs	136.0 to 138.7
— Digital outputs	136.0 to 137.7
— Analog inputs	800 to 809
— Analog outputs	800 to 803
<b>Subprocess images</b>	
• Number of subprocess images, max.	1; With PROFINET IO, the length of the user data is limited to 1600 bytes
<b>Digital channels</b>	
• Inputs	16 048
— of which central	1 016

• Outputs	16 096
— of which central	1 008
<b>Analog channels</b>	
• Inputs	1 006
— of which central	253
• Outputs	1 007
— of which central	250
<b>Hardware configuration</b>	
Number of expansion units, max.	3
<b>Number of DP masters</b>	
• integrated	1
• via CP	4
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	8
• CP, PtP	8
• CP, LAN	10
<b>Rack</b>	
• Racks, max.	4
• Modules per rack, max.	8; In rack 3 max. 7
<b>Time of day</b>	
<b>Clock</b>	
• 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
<b>Operating hours counter</b>	
• Number	1
• Number/Number range	0
• Range of values	0 to 2 <sup>31</sup> hours (when using SFC 101)
• Granularity	1 h
• retentive	Yes; Must be restarted at each restart
<b>Clock synchronization</b>	
• supported	Yes
• to MPI, master	Yes
• to MPI, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
<b>Digital inputs</b>	

Number of digital inputs	24
<ul style="list-style-type: none"> <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
<b>Number of simultaneously controllable inputs</b>	
<b>horizontal installation</b>	
— up to 40 °C, max.	24
— up to 60 °C, max.	12
<b>vertical installation</b>	
— up to 40 °C, max.	12
<b>Input voltage</b>	
<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• for signal "0"</li> </ul>	-3 to +5V
<ul style="list-style-type: none"> <li>• for signal "1"</li> </ul>	+15 to +30 V
<b>Input current</b>	
<ul style="list-style-type: none"> <li>• for signal "1", typ.</li> </ul>	8 mA
<b>Input delay (for rated value of input voltage)</b>	
<b>for standard inputs</b>	
— 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
<b>for technological functions</b>	
— at "0" to "1", max.	8 µs; Minimum pulse width/minimum pause between pulses at maximum counting frequency
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m; 50 m for technological functions
<ul style="list-style-type: none"> <li>• unshielded, max.</li> </ul>	600 m; for technological functions: No
<b>for technological functions</b>	
— shielded, max.	50 m; at maximum count frequency
— unshielded, max.	not allowed
<b>Digital outputs</b>	
Number of digital outputs	16
<ul style="list-style-type: none"> <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 style="list-style-type: none"> <li>• Response threshold, typ.</li> </ul>	1 A
Limitation of inductive shutdown voltage to	L+ (-48 V)
Controlling a digital input	Yes

<b>Switching capacity of the outputs</b>	
• on lamp load, max.	5 W
<b>Load resistance range</b>	
• lower limit	48 Ω
• upper limit	4 kΩ
<b>Output voltage</b>	
• for signal "1", min.	L+ (-0.8 V)
<b>Output current</b>	
• 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
<b>Parallel switching of two outputs</b>	
• for uprating	No
• for redundant control of a load	Yes
<b>Switching frequency</b>	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	100 Hz
• of the pulse outputs, with resistive load, max.	2.5 kHz
<b>Total current of the outputs (per group)</b>	
<b>horizontal installation</b>	
— up to 40 °C, max.	3 A
— up to 60 °C, max.	2 A
<b>vertical installation</b>	
— up to 40 °C, max.	2 A
<b>Cable length</b>	
• shielded, max.	1 000 m
• unshielded, max.	600 m
<b>Analog inputs</b>	
<b>Number of analog inputs</b>	
• For voltage/current measurement	4
• For resistance/resistance thermometer measurement	1
integrated channels (AI)	5; 4x current/voltage, 1x 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
<b>Input ranges</b>	
• Voltage	Yes; $\pm 10$ V / 100 k $\Omega$ ; 0 V to 10 V / 100 k $\Omega$
• Current	Yes; $\pm 20$ mA / 100 $\Omega$ ; 0 mA to 20 mA / 100 $\Omega$ ; 4 mA to 20 mA / 100 $\Omega$
• Resistance thermometer	Yes; Pt 100 / 10 M $\Omega$
• Resistance	Yes; 0 $\Omega$ to 600 $\Omega$ / 10 M $\Omega$
<b>Input ranges (rated values), voltages</b>	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	100 k $\Omega$
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	100 $\Omega$
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	100 $\Omega$
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	100 $\Omega$
<b>Input ranges (rated values), resistance thermometer</b>	
• Pt 100	Yes
— Input resistance (Pt 100)	10 M $\Omega$
<b>Input ranges (rated values), resistors</b>	
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	10 M $\Omega$
<b>Thermocouple (TC)</b>	
Temperature compensation	
— parameterizable	No
<b>Characteristic linearization</b>	
• parameterizable	Yes; by software
<b>Cable length</b>	
• shielded, max.	100 m
<b>Analog outputs</b>	
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
<b>Output ranges, voltage</b>	
• 0 to 10 V	Yes
• -10 V to +10 V	Yes



<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Connection of actuators</b>	
• for voltage output two-wire connection	Yes; Without compensation of the line resistances
• for voltage output four-wire connection	No
• for current output two-wire connection	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 k $\Omega$
• with voltage outputs, capacitive load, max.	0.1 $\mu$ F
• with current outputs, max.	300 $\Omega$
• with current outputs, inductive load, max.	0.1 mH
<b>Destruction limits against externally applied voltages and currents</b>	
• Voltages at the outputs towards MANA	16 V; Permanent
• Current, max.	50 mA; Permanent
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value generation for the inputs</b>	
Measurement principle	Actual value encryption (successive approximation)
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	12 bit
• Integration time, parameterizable	Yes; 16.6 / 20 ms
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
• permissible input frequency, max.	400 Hz
• Time constant of the input filter	0.38 ms
• Basic execution time of the module (all channels released)	1 ms
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	1 ms
<b>Settling time</b>	
• for resistive load	0.6 ms
• for capacitive load	1 ms
• for inductive load	0.5 ms
<b>Encoder</b>	
Connection of signal encoders	

<ul style="list-style-type: none"> <li>• for voltage measurement</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer</li> </ul>	Yes; with external supply
<ul style="list-style-type: none"> <li>• for current measurement as 4-wire transducer</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with two-wire connection</li> </ul>	Yes; Without compensation of the line resistances
<ul style="list-style-type: none"> <li>• for resistance measurement with three-wire connection</li> </ul>	No
<ul style="list-style-type: none"> <li>• for resistance measurement with four-wire connection</li> </ul>	No

### Connectable encoders

<ul style="list-style-type: none"> <li>• 2-wire sensor</li> </ul>	Yes
<ul style="list-style-type: none"> <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 style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	1 %
<ul style="list-style-type: none"> <li>• Current, relative to input range, (+/-)</li> </ul>	1 %
<ul style="list-style-type: none"> <li>• Resistance, relative to input range, (+/-)</li> </ul>	1 %
<ul style="list-style-type: none"> <li>• Voltage, relative to output range, (+/-)</li> </ul>	1 %
<ul style="list-style-type: none"> <li>• Current, relative to output range, (+/-)</li> </ul>	1 %

### Basic error limit (operational limit at 25 °C)

<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.8 %; Linearity error ±0.06 %
<ul style="list-style-type: none"> <li>• Current, relative to input range, (+/-)</li> </ul>	0.8 %; Linearity error ±0.06 %
<ul style="list-style-type: none"> <li>• Resistance, relative to input range, (+/-)</li> </ul>	0.8 %; Linearity error ±0.2 %
<ul style="list-style-type: none"> <li>• Resistance thermometer, relative to input range, (+/-)</li> </ul>	0.8 %
<ul style="list-style-type: none"> <li>• Voltage, relative to output range, (+/-)</li> </ul>	0.8 %
<ul style="list-style-type: none"> <li>• Current, relative to output range, (+/-)</li> </ul>	0.8 %

### Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1 =$ interference frequency

<ul style="list-style-type: none"> <li>• Series mode interference (peak value of interference &lt; rated value of input range), min.</li> </ul>	30 dB
<ul style="list-style-type: none"> <li>• Common mode interference, min.</li> </ul>	40 dB

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	1; Combined MPI / PROFIBUS DP
Number of RS 422 interfaces	0

### 1. Interface

Interface type	Integrated RS 485 interface
Physics	RS 485
Isolated	Yes
Power supply to interface (15 to 30 V DC), max.	200 mA

#### Protocols

• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No

#### MPI

• Transmission rate, max.	12 Mbit/s
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#### 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
<b>Address area</b>	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
<b>PROFIBUS DP slave</b>	
• 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
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes; Only with active interface
— 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
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte

<b>2. Interface</b>	
Interface type	PROFINET
Physics	Ethernet RJ45
Isolated	Yes
automatic detection of transmission rate	Yes; 10/100 Mbit/s
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	Yes
<b>Interface types</b>	
• Number of ports	2
• integrated switch	Yes
<b>Protocols</b>	

• 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	No
• Open IE communication	Yes; Via TCP/IP, ISO on TCP, and UDP
• Web server	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
<b>Services</b>	
— 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
— Number of IO devices with prioritized startup, max.	32
— Number of connectable IO Devices, max.	128
— 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"	128
— of which in line, max.	61
— Number of connectable IO Devices for RT, max.	128
— of which in line, max.	128
— 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)

<b>Address area</b>	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
— User data consistency, max.	1 024 byte
<b>PROFINET IO Device</b>	
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— S7 communication	Yes; With loadable FBs, max. configurable connections: 10, max. number of instances: 32
— Isochronous mode	No
— Open IE communication	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
— Number of IO Controllers with shared device, max.	2
<b>Transfer memory</b>	
— Inputs, max.	1 440 byte; Per IO Controller with shared device
— Outputs, max.	1 440 byte; Per IO Controller with shared device
<b>Submodules</b>	
— Number, max.	64
— User data per submodule, max.	1 024 byte
<b>PROFINET CBA</b>	
• acyclic transmission	Yes
• cyclic transmission	Yes
<b>Open IE communication</b>	
• Number of connections, max.	8
• 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
<b>Protocols</b>	
<b>Redundancy mode</b>	
<b>Media redundancy</b>	
— Switchover time on line break, typ.	200 ms; PROFINET MRP
— Number of stations in the ring, max.	50
<b>Open IE communication</b>	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	8
— Data length for connection type 01H, max.	1 460 byte
— Data length for connection type 11H, max.	32 768 byte

— several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	8
— Data length, max.	32 768 byte
• UDP	Yes; via integrated PROFINET interface and loadable FBs
— Number of connections, max.	8
— Data length, max.	1 472 byte
<b>Web server</b>	
• supported	Yes
• User-defined websites	Yes
• Number of HTTP clients	5
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes; For PROFINET only
<b>Communication functions</b>	
PG/OP communication	Yes
Data record routing	Yes
<b>Global data communication</b>	
• supported	Yes
• Number of GD loops, max.	8
• Number of GD packets, max.	8
• Number of GD packets, transmitter, max.	8
• Number of GD packets, receiver, max.	8
• Size of GD packets, max.	22 byte
• Size of GD packet (of which consistent), max.	22 byte
<b>S7 basic communication</b>	
• supported	Yes
• User data per job, max.	76 byte
• User data per job (of which consistent), max.	76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server)
<b>S7 communication</b>	
• 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)
<b>S5 compatible communication</b>	
• supported	Yes; via CP and loadable FC
<b>PROFINET CBA (at set setpoint communication load)</b>	
• Setpoint for the CPU communication load	50 %

• Number of remote interconnection partners	32
• Number of functions, master/slave	30
• Total of all master/slave connections	1 000
• Data length of all incoming connections master/slave, max.	4 000 byte
• Data length of all outgoing connections master/slave, max.	4 000 byte
• Number of device-internal and PROFIBUS interconnections	500
• Data length of device-internal und PROFIBUS interconnections, max.	4 000 byte
• Data length per connection, max.	1 400 byte
<b>Remote interconnections with acyclic transmission</b>	
— Sampling frequency: Sampling time, min.	500 ms
— Number of incoming interconnections	100
— Number of outgoing interconnections	100
— Data length of all incoming interconnections, max.	2 000 byte
— Data length of all outgoing interconnections, max.	2 000 byte
— Data length per connection, max.	1 400 byte
<b>Remote interconnections with cyclic transmission</b>	
— Transmission frequency: Transmission interval, min.	10 ms
— Number of incoming interconnections	200
— Number of outgoing interconnections	200
— Data length of all incoming interconnections, max.	2 000 byte
— Data length of all outgoing interconnections, max.	2 000 byte
— Data length per connection, max.	450 byte
<b>HMI variables via PROFINET (acyclic)</b>	
— 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	200
— Data length of all HMI variables, max.	2 000 byte
<b>PROFIBUS proxy functionality</b>	
— supported	Yes
— Number of linked PROFIBUS devices	16
— Data length per connection, max.	240 byte; Slave-dependent
<b>Number of connections</b>	
• overall	12



- usable for PG communication
  - reserved for PG communication
  - adjustable for PG communication, min.
  - adjustable for PG communication, max.
- usable for OP communication
  - reserved for OP communication
  - adjustable for OP communication, min.
  - adjustable for OP communication, max.
- usable for S7 basic communication
  - reserved for S7 basic communication
  - adjustable for S7 basic communication, min.
  - adjustable for S7 basic communication, max.
- usable for S7 communication
  - reserved for S7 communication
  - adjustable for S7 communication, min.
  - adjustable for S7 communication, max.
- total number of instances, max.
- usable for routing

11
1
1
11
11
1
1
11
8
0
0
8
10
0
0
10
32
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

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

<ul style="list-style-type: none"> <li>• Number of entries, max. <ul style="list-style-type: none"> <li>— adjustable</li> <li>— of which powerfail-proof</li> </ul> </li> <li>• Number of entries readable in RUN, max. <ul style="list-style-type: none"> <li>— adjustable</li> <li>— preset</li> </ul> </li> </ul>	500 No 100; Only the last 100 entries are retained 499 Yes; From 10 to 499 10
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<b>Service data</b>	
<ul style="list-style-type: none"> <li>• can be read out</li> </ul>	Yes

### Interrupts/diagnostics/status information

<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>• Status indicator digital input (green)</li> <li>• Status indicator digital output (green)</li> </ul>	Yes Yes

### 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)	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

<b>Potential separation digital inputs</b>	
<ul style="list-style-type: none"> <li>• Potential separation digital inputs</li> <li>• between the channels</li> <li>• between the channels and backplane bus</li> </ul>	Yes No Yes

<b>Potential separation digital outputs</b>	
<ul style="list-style-type: none"> <li>• Potential separation digital outputs</li> <li>• between the channels</li> <li>• between the channels, in groups of</li> <li>• between the channels and backplane bus</li> </ul>	Yes Yes 8 Yes

<b>Potential separation analog inputs</b>	
<ul style="list-style-type: none"> <li>• Potential separation analog inputs</li> <li>• between the channels</li> <li>• between the channels and backplane bus</li> </ul>	Yes; common for analog I/O No Yes

<b>Potential separation analog outputs</b>	
<ul style="list-style-type: none"> <li>• Potential separation analog outputs</li> <li>• between the channels</li> <li>• between the channels and backplane bus</li> </ul>	Yes; common for analog I/O No Yes

Isolation	
Isolation tested with	600 V DC
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	8
• System functions (SFC)	see instruction list
• System function blocks (SFB)	see instruction list
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Know-how protection	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	120 mm
Height	125 mm
Depth	130 mm
Weights	
Weight, approx.	730 g
<b>last modified:</b>	04/09/2020