## **SIEMENS**

## Data sheet

## 6ES7214-1AG40-0XB0

SIMATIC S7-1200, CPU 1214C, COMPACT CPU, DC/DC/DC, ONBOARD I/O: 14 DI 24V DC; 10 DO 24 V DC; 2 AI 0 - 10V DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA

MEMORY: 100 KB



General information	
Product type designation	CPU 1214C DC/DC/DC
Firmware version	V4.2
Engineering with	
Programming package	STEP 7 V14 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Load voltage L+	
Rated value (DC)	24 V
<ul><li>permissible range, lower limit (DC)</li></ul>	20.4 V
• permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption (rated value)	500 mA; CPU only
Current consumption, max.	1 500 mA; CPU with all expansion modules

Inrush current, max.	12 A; at 28.8 V
	0.5 A <sup>2</sup> ·s
Output current	4 COO to A. May, 5 V DC for CM and CM
for backplane bus (5 V DC), max.	1 600 mA; Max. 5 V DC for SM and CM
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	12 W
N.	
Memory Work memory	
• integrated	100 kbyte
expandable	No
Load memory	
• integrated	4 Mbyte
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	with SIMATIC memory card
Backup	
• present	Yes
maintenance-free	Yes
without battery	Yes
·	
CPU processing times	
for bit operations, typ.	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 μs; / instruction
CPU-blocks	
Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of
	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used
OB	restriction, the entire working memory can be used
• Number, max.	Limited only by RAM for code
- Number, max.	
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags),	10 kbyte
max.	
Number, max.	8 kbyte; Size of bit memory address area
Local data	5 may 1.5, 5 may 1.5 m
• per priority class, max.	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
por priority diado, max.	to 26: 6 KB
4.11	
Address area Process image	
1 100ess illiage	

• Inputs, adjustable	1 kbyte	
Outputs, adjustable	1 kbyte	
Hardware configuration		
Number of modules per system, max.	3 comm. modules, 1 signal board, 8 signal modules	
Time of day		
Clock		
Hardware clock (real-time)	Yes	
Backup time	480 h; Typical	
Deviation per day, max.	+/- 60 s/month at 25 °C	
Digital inputs  Number of digital inputs	14: Integrated	
	14; Integrated	
<ul> <li>of which inputs usable for technological functions</li> </ul>	6; HSC (High Speed Counting)	
Source/sink input	Yes	
Number of simultaneously controllable inputs		
all mounting positions		
— up to 40 °C, max.	14	
Input voltage		
Rated value (DC)	24 V	
• for signal "0"	5 V DC at 1 mA	
• for signal "1"	15 V DC at 2.5 mA	
Input delay (for rated value of input voltage)		
for standard inputs		
— parameterizable	0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	
— at "0" to "1", min.	0.2 ms	
— at "0" to "1", max.	12.8 ms	
for interrupt inputs		
— parameterizable	Yes	
for counter/technological functions		
— parameterizable	Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz	
Cable length		
• shielded, max.	500 m; 50 m for technological functions	
• unshielded, max.	300 m; For technological functions: No	
Digital outputs		
Number of digital outputs	10	
• of which high-speed outputs	4; 100 kHz Pulse Train Output	
Limitation of inductive shutdown voltage to	L+ (-48 V)	
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	

• For signal "0", max.         0.1 V; with 10 kOhm load           • For signal "1", min.         20 V           Output current         0.5 A           • For signal "1" rated value         0.5 A           • For signal "0" residual current, max.         0.1 mA           Output delay with resistive load         • "0" to "1", max.           • "1" to "0", max.         5 μs           Switching frequency         • of the pulse outputs, with resistive load, max.         100 kHz           Cable length         • shielded, max.         500 m           • unshielded, max.         500 m         • shielded, max.           Analog inputs         2         Input ranges           • Voltage         Yes         Input ranges (rated values), voltages           • 0 to +10 V         Yes         • long the shielded, max.           Analog nutputs         100 m; twisted and shielded           Analog value generation for the inputs         Integration and conversion time/resolution per channel           • Resolution with overrange (bit including sign), max.         • In the gration time, parameterizable         Yes           • Conversion time (per channel)         625 μs           Encoder         Conversion time (per channel)         625 μs           Encoder         Conversion time (per channel)         PROFI	• on lamp load, max.	5 W
• for signal "1", min.  Output current  • for signal "0" residual current, max.  O.1 mA  Output delay with resistive load  • "0" to "1", max.  • "1" to "0", max.  • "1" to "0", max.  • skitching frequency  • of the pulse outputs, with resistive load, max.  Cable length  • shielded, max.  • unshielded, max.  • unshielded, max.  • voltage  • Voltage  • Voltage  • Voltage  • Input ranges (rated values), voltages  • 0 to +10 V  • Input resistance (0 to 10 V)  Cable length  • shielded, max.  • 100 m; twisted and shielded  Analog outputs  Number of analog outputs  • O to +10 V  • Input resistance (7 to 10 V)  • Input resistance (8 to 10 V)  Cable length  • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  O  Analog value generation for the inputs Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  PROFINET  Physics  Interface  In	Output voltage	
Output current  • for signal "1" rated value • for signal "0" residual current, max.  Othout delay with resistive load • "0" to "1", max. • "1" to "0", max.  Switching frequency • of the pulse outputs, with resistive load, max.  Cable length • shelded, max. • unshielded, max.  500 m  shelded, max.  500 m  Analog inputs  Number of analog inputs  Input ranges • Vottage Input ranges (rated values), voltages • 0 to +10 V • Input resistance (0 to 10 V)  Cable length • shelded, max.  100 kHz  Cable length • Shelded, max.  150 m  Analog outputs  Number of analog outputs  O to +10 V • Input resistance (0 to 10 V)  Cable length • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  O Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Conversion time (per channel)  Encoder  Connectable encoders • 2-wire sensor  Yes  Interface Interfac	• for signal "0", max.	0.1 V; with 10 kOhm load
for signal "1" rated value   0.5 A     for signal "0" residual current, max.   0.1 mA     Output delay with resistive load     "0" to "1", max.   1 µs     "1" to "0", max.   5 µs     Switching frequency     of the pulse outputs, with resistive load, max.     Cable length     shielded, max.   500 m     shielded, max.   150 m     Analog inputs     Number of analog inputs   2     Input ranges     Voltage   Yes     Input ranges (rated values), voltages     0 to +10 V   Yes     Input resistance (0 to 10 V)   2100k ohms     Cable length     shielded, max.   100 m; twisted and shielded     Analog outputs   0     Analog outputs   0     Analog outputs   0     Analog value generation for the inputs     Integration and conversion time/resolution per channel     Resolution with overrange (bit including sign), max.     Integration time, parameterizable   Yes     Conversion time (per channel)   625 µs     Encoder     Connectable encoders     2-wire sensor   Yes     Interface     Interface     Interface     Interface     PROFINET     Physics     Isloated   Yes     Interface   Yes     Isloated   Yes     Isloate	• for signal "1", min.	20 V
• for signal "0" residual current, max.  Output delay with resistive load  • "0" to "1", max. • "1" to "0", max.  5 µs  Switching frequency  • of the pulse outputs, with resistive load, max.  Cable length • shielded, max. • shielded, max. • shielded, max. • shielded, max. • voltage  • Voltage  Input ranges • Voltage  Input ranges (rated values), voltages • 0 to +10 V • Input resistance (0 to 10 V)  Cable length • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  O  Analog value generation for the inputs  Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable yes • Conversion time (per channel) • 625 µs  Encoder  Connectable encoders • 2-wire sensor  Yes  Interface  Interface  PROFINET  Physics  Ethernet  Isolated	Output current	
Output delay with resistive load  • "0" to "1", max.	• for signal "1" rated value	0.5 A
• "0" to "1", max. • "1" to "0", max. 5 µs  Switching frequency • of the pulse outputs, with resistive load, max. Cable length • shielded, max. • unshielded, max. 500 m • unshielded, max. 500 m  Analog inputs  Number of analog inputs 2 linput ranges • Voltage Input ranges (rated values), voltages • 0 to +10 V • Input resistance (0 to 10 V) Cable length • shielded, max. 100 m; twisted and shielded  Analog outputs  Number of analog outputs 0  Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Conversion time (per channel)  Encoder  Connectable encoders • 2-wire sensor  Yes  Interface Interface Physics Ethernet Isolated  PROFINET	• for signal "0" residual current, max.	0.1 mA
• "1" to "0", max.  Switching frequency • of the pulse outputs, with resistive load, max.  Cable length • shielded, max.	Output delay with resistive load	
Switching frequency  • of the pulse outputs, with resistive load, max.  Cable length  • shielded, max.  • unshielded, max.  150 m   Analog inputs  Number of analog inputs  Input ranges  • Voltage  Input ranges (rated values), voltages  • 0 to +10 V  • Input resistance (0 to 10 V)  Cable length  • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  O  Analog value generation for the inputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  Interface  Interface  Interface  Interface  Interface  Interface  Interface  Interface  Interface  Interface type  PROFINET  Physics  Ethernet  Isolated	• "0" to "1", max.	1 μs
of the pulse outputs, with resistive load, max.  Cable length     shielded, max.     unshielded, max.  Soo m Iso m  Analog inputs  Number of analog inputs  Voltage Input ranges     Voltage Input ranges (rated values), voltages     O to +10 V     Input resistance (0 to 10 V)  Cable length     shielded, max.  Ino m; twisted and shielded  Analog outputs  Number of analog outputs  Number of analog outputs  Integration and conversion time/resolution per channel     Resolution with overrange (bit including sign), max.     Integration time, parameterizable     Conversion time (per channel)  Encoder  Encoder  Encoder  Connectable encoders     2-wire sensor  Yes  Interface Interface Interface Interface type PROFINET Physics Ethernet Isolated	• "1" to "0", max.	5 μs
Cable length  • shielded, max.  • unshielded, max.  150 m   Analog inputs  Number of analog inputs  2 Input ranges  • Voltage  Input ranges (rated values), voltages  • 0 to +10 V  • Input resistance (0 to 10 V)  Cable length  • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  Number of analog outputs  0  Analog value generation for the inputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable Yes  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  Interface  Interface type  PROFINET  Physics  Ethernet  Isolated	Switching frequency	
shielded, max.     unshielded, max.     150 m  Analog inputs  Number of analog inputs  2 Input ranges     Voltage     Input ranges (rated values), voltages	• of the pulse outputs, with resistive load, max.	100 kHz
• unshielded, max.  Analog inputs  Number of analog inputs      • Voltage     • Voltage     • Voltage     • Voltage  Input ranges (rated values), voltages      • 0 to +10 V     • Input resistance (0 to 10 V)  Cable length      • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  0  Analog value generation for the inputs  Integration and conversion time/resolution per channel      • Resolution with overrange (bit including sign), max.      • Integration time, parameterizable     • Conversion time (per channel)  Encoder  Connectable encoders      • 2-wire sensor  Yes  1. Interface  Interface  Interface type  PROFINET  Physics  Ethernet  Isolated	Cable length	
Analog inputs  Number of analog inputs  • Voltage  • Voltage  Input ranges (rated values), voltages  • 0 to +10 V  • Input resistance (0 to 10 V)  Cable length  • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  O  Analog value generation for the inputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  1. Interface  Interface type  PROFINET  Physics  Ethernet  Isolated	• shielded, max.	500 m
Number of analog inputs 2 Input ranges  • Voltage Yes Input ranges (rated values), voltages  • 10 to +10 V Yes • Input resistance (0 to 10 V) 2100k ohms  Cable length • shielded, max. 100 m; twisted and shielded  Analog outputs Number of analog outputs 0  Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs  Encoder  Connectable encoders • 2-wire sensor Yes  1. Interface Interface type PROFINET Physics Ethernet Isolated Yes	• unshielded, max.	150 m
Number of analog inputs 2 Input ranges  • Voltage Yes Input ranges (rated values), voltages  • 10 to +10 V Yes • Input resistance (0 to 10 V) 2100k ohms  Cable length • shielded, max. 100 m; twisted and shielded  Analog outputs Number of analog outputs 0  Analog value generation for the inputs Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable Yes • Conversion time (per channel) 625 µs  Encoder Connectable encoders • 2-wire sensor Yes  1. Interface Interface type PROFINET Physics Ethernet Isolated Yes	Analog inputs	
Input ranges  • Voltage Input ranges (rated values), voltages  • 0 to +10 V  • Input resistance (0 to 10 V)  Cable length  • shielded, max.  Inumber of analog outputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  Interface  Interface  Interface type  PROFINET  Physics  Ethernet  Isolated		2
Voltage     Input ranges (rated values), voltages		
Input ranges (rated values), voltages  • 0 to +10 V • Input resistance (0 to 10 V)  Cable length • shielded, max.  Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Conversion time (per channel)  Encoder  Connectable encoders • 2-wire sensor  Yes  Interface Interface type PROFINET Physics Esthernet Isolated		Yes
● 0 to +10 V Pes Input resistance (0 to 10 V) Pelous homs  Cable length Pelous hielded, max.  Analog outputs Number of analog outputs  Integration and conversion time/resolution per channel Pesolution with overrange (bit including sign), max. Integration time, parameterizable Percoder Connectable encoders Percoder Connectable encoders Percoder Interface type Profinet Physics Ethernet Isolated Profinet Physics Ethernet Ethernet Isolated		
Cable length  • shielded, max.  100 m; twisted and shielded  Analog outputs  Number of analog outputs  0  Analog value generation for the inputs Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable Yes  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  1. Interface Interface type PROFINET Physics Ethernet Isolated  Yes		Yes
Cable length  • shielded, max.  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Interface  Interface  Interface  Interface type  PROFINET  Physics  Isolated  Isolated  Interface vyes  Interface vyes  PROFINET  Ethernet  Isolated	<ul> <li>Input resistance (0 to 10 V)</li> </ul>	≥100k ohms
Analog outputs  Number of analog outputs  O  Analog value generation for the inputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable Yes  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  1. Interface  Interface type  Physics  Ethernet  Isolated  Yes		
Number of analog outputs  Analog value generation for the inputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable Yes  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  1. Interface Interface type PROFINET Physics Ethernet Isolated  Yes	• shielded, max.	100 m; twisted and shielded
Number of analog outputs  Analog value generation for the inputs  Integration and conversion time/resolution per channel  • Resolution with overrange (bit including sign), max.  • Integration time, parameterizable Yes  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  Yes  1. Interface Interface type PROFINET Physics Ethernet Isolated  Yes	Analog outputs	
Integration and conversion time/resolution per channel  Resolution with overrange (bit including sign), max.  Integration time, parameterizable Conversion time (per channel)  Fincoder  Connectable encoders  2-wire sensor  Yes  1. Interface Interface type PROFINET Physics Isolated  Yes		0
Integration and conversion time/resolution per channel  Resolution with overrange (bit including sign), max.  Integration time, parameterizable Conversion time (per channel)  Fincoder  Connectable encoders  2-wire sensor  Yes  1. Interface Interface type PROFINET Physics Isolated  Yes	Analog value generation for the inputs	
<ul> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable Yes</li> <li>Conversion time (per channel)</li> <li>625 µs</li> </ul> Encoder Connectable encoders <ul> <li>2-wire sensor</li> <li>Yes</li> </ul> 1. Interface Interface type <ul> <li>PROFINET</li> <li>Physics</li> <li>Ethernet</li> <li>Isolated</li> </ul> Yes 1. Isolated Yes Yes Yes PROFINET Physics <ul> <li>Ethernet</li> <li>Ethernet</li> </ul> Yes		
max.  • Integration time, parameterizable  • Conversion time (per channel)  Encoder  Connectable encoders  • 2-wire sensor  1. Interface Interface type Physics Physics Ethernet Isolated  Yes  Yes		10 bit
Conversion time (per channel)      Encoder      Connectable encoders		
Encoder  Connectable encoders  • 2-wire sensor  1. Interface Interface type PROFINET Physics Ethernet Isolated Yes	Integration time, parameterizable	Yes
Connectable encoders  • 2-wire sensor  1. Interface Interface type PROFINET Physics Ethernet Isolated Yes	<ul> <li>Conversion time (per channel)</li> </ul>	625 µs
Connectable encoders  • 2-wire sensor  1. Interface Interface type PROFINET Physics Ethernet Isolated Yes	Encoder	
1. Interface Interface type PROFINET Physics Ethernet Isolated Yes		
Interface type PROFINET  Physics Ethernet Isolated Yes	• 2-wire sensor	Yes
Physics Ethernet Isolated Yes	1. Interface	
Isolated Yes	Interface type	PROFINET
	Physics	Ethernet
automatic detection of transmission rate  Yes	Isolated	Yes
	automatic detection of transmission rate	Yes

Autocrossing Yes  Interface types  • Number of ports • Integrated switch  PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Ves • Simatric Communication • Ves • Media redundancy • Mobility  PROFINET IO Controller • Transmission rate, max.  PROFINET IO Communication • Yes • Media redundancy • No  PROFINET IO Controller  • Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes • Ves • Services  PGOP communication  Yes • No  PROFINET IO Controller  • Transmission rate, max.  100 Mbit/s  Services  PGOP communication  Yes  IND • PROFICE communication  Yes  IND • PROFIce of Controller  No  PROFICE of Communication  PROFICE of Communication  IND • PROFIce of Controller  No  PROFICE of Communication  PROFICE of Communication  IND • PROFINET IO Devices that can be simultaneously activated/deactivated, max.  Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  PROFINET IO Device Intervention of ID Revices Interv	Autonegotiation	Yes
Interface types  • Number of ports • integrated switch  FROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Ves • Support of Controller • Ves • Simatric communication • Ves • Open IE communication • Ves • Media redundancy • No  PROFINET IO Controller • Transmission rate, max.  Services  - PG/OP communication  Yes - Sr routing - It communication - ST routing - No - No - Open IE communication - Ves - No		
Number of ports Integrated switch No  Functionality PROFINET IO Controller PROFINET IO Device SIMATIC communication Yes SIMATIC communication Yes Web serve Media redundancy No  PROFINET IO Controller Transmission rate, max  Services PGO/P communication Yes Services PGO/P communication Yes No PROFINET IO Controller  Transmission rate, max  Services PGO/P communication Yes Services PGO/P communication No No No PROFINET Web No No PROFINET OF Controller PGO/P communication FRT No No PROFINET No No No PROFINET No No No PROFINET No No No PROFINET No		163
Integrated switch  Functionality  PROFINET IO Controller PROFINET IO Device PROFINET IO Device SiMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller  Transmission rate, max.  100 Mbit/s  PROFINET IO Communication Pes PROFINET IO Controller  Transmission rate, max.  100 Mbit/s  PROFINET IO Controller  PEG/OP communication Pes PROFINET OPEN PROFINET IO Controller  PROFINET IO Controller PROFINET IO Controller  PROFINET IO Controller PROFINET IO Controller PROFINET IO Controller PROFINET IO Controller PROFINET IO Device  PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device PROFINET IO Device ID PROFINET IO Device		1
Functionality  PROFINET IO Device Yes PROFINET IO Device Yes SIMATIC communication Yes Open IE communication Yes Media redundancy No PROFINET IO Controller  Transmission rate, max. 100 Mbit/is  Services PCJOP communication Yes Isochronous mode No Open IE communication Yes IRT No MRP No PROFINET O Revice Satury PROFINET Of devices with prioritized startup, max. No No No PROFINE To devices with prioritized startup, max. No white rid Io devices with prioritized startup, max. No white rid Connectable IO Devices for RT, max. No white rid Connectable IO Devices for RT, max. No white rid Connectable IO Devices for RT, max. No white rid Connectable IO Devices for RT, max. No white rid Connectable IO Devices for RT, max. Number of IO Devices that can be simultaneously activated/deactivated, max. Updating time  PROFINET IO Device  PROFINET IO Device  Services PCJOP communication Yes	·	
PROFINET IO Controller PROFINET IO Device SiMATIC communication Yes Open IE communication Web server Media redundancy No  PROFINET IO Controller  Transmission rate, max. 100 Mbit/s  Services  — PG/OP communication Yes — No — No — Open IE communication Yes — IRT — No — MRP — MRP — MRP — MRP — PROFlenergy — Proiritized startup — Proiritized startup — Number of IO devices with prioritized startup, max. — of which in line, max. — Activation/deactivated, max. — Updating time  PROFINET IO Device  Services  PROFINET IO Device  Services  — PG/OP communication Yes — Number of IO Devices Services  — PG/OP communication Yes — Number of IO Devices that can be simultaneously activated/deactivated, max. — Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  — PG/OP communication — S7 routing — Isochronous mode  Yes — Isochronous mode		
PROFINET IO Device SIMATIC communication Yes Open IE communication Yes Web server Media redundancy No  PROFINET IO Controller  Transmission rate, max. 100 Mbit/s  Services  PG/OP communication Yes Services  PG/OP communication Yes Isochronous mode Open IE communication Yes IND No No PROFINET IO Controller  PG/OP communication Yes IND No PROFINET OPEN No No PROFINET OPEN No No PROFINET OPEN No No PROFINET OPEN No No No PROFINET OPEN No No No No No No PROFINET OPEN No		Yes
SIMATIC communication Open IE communication Ves Web server Media redundancy No  PROFINET IO Controller  Transmission rate, max. 100 Mbit/s  Services  — PG/OP communication Yes — S7 routing — Isochronous mode — Open IE communication — IRT — MRP — No — MRP — MRP — No — PROFIenergy — No — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of IO Devices for RT, max. — of which in line, max. — Activation/deactivation of IO Devices — Number of IO Devices that can be simultaneously activated/deactivated, max. — Updating time  PROFINET IO Device  Services  — PG/OP communication  Yes Services — PG/OP communication  Yes Services — PG/OP communication  Yes Services — PG/OP communication  Yes Services — PG/OP communication  Yes Services — S7 routing — Isochronous mode  No		
Open IE communication Web server Media redundancy No  PROFINET IO Controller  Transmission rate, max.  Services  - PG/OP communication - S7 routing - Isochronous mode - Open IE communication - IRT - MRP - MRPD - PROFlenergy - Prioritized startup - Prioritized startup - Number of IO devices with prioritized startup, max Of which in line, max of which in line, max Updating time  PROFINET IO Device  Services  - PG/OP communication  • Wes - Namber of IO Devices that can be simultaneously activated/deactivated, max PG/OP communication - S7 routing - PG/OP communication - S7 routing - Schools Services - PG/OP communication - S7 routing - S6 routing - S7 routing - S7 routing - S7 routing - S6 routing - S7		
Media redundancy Mo  PROFINET IO Controller  Transmission rate, max.  PROFOP communication Services  PG/OP communication Socious  PS routing In sochronous mode Open IE communication PROF INET No MRP No MRP No MRP No PROF lenergy Prioritized startup Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max. Of which in line, max. Activation/deactivation of IO Devices Number of IO Devices that can be simultaneously activated/deactivated, max. Updating time  PROFINET IO Device  PROFOP Communication PSOF routing PG/OP communication PSOF routing PG/OP communication PSOF routing PS		Yes
Media redundancy  PROFINET IO Controller  Transmission rate, max.  Services  - PG/OP communication - S7 routing - Isochronous mode - Open IE communication - IRT - MRP - MRP - MRPD - MRPD - PROFIenergy - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of Connectable IO Devices for RT, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time  PROFINET IO Device  Services - PG/OP communication - S7 routing - Isochronous mode  100 Mbit/s  Yes - Number of Lodevices - Yes - Rumber of Connectable IO Devices - Services - PG/OP communication - S7 routing - Isochronous mode  100 Mbit/s  Yes - No Mbit/s - Yes - Number of Lodevices with prioritized - Services - PG/OP communication - S7 routing - Isochronous mode  Yes - Services	•	Yes
PROFINET IO Controller  • Transmission rate, max.  Services  - PG/OP communication Yes - S7 routing Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRP No - MRPD No - PROFInergy No - Prioritized startup Yes - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Activation/deactivation of IO Devices Yes - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time  PROFINET IO Device  Services - PG/OP communication Yes - S7 routing Yes - Isochronous mode  100 Mbit/s  100 Mbit/s  Yes - No		No
Transmission rate, max.  Services  - PG/OP communication Yes - S7 routing Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRP No - MRPD No - PROFINET IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time  - PROFINET IO Device - S7 routing - S6 No - Number Of Open Manual Services - Number of IO Devices - PG/OP communication - S7 routing - S5 routing - Isochronous mode  Yes - Scroiding - S6 Routing Services - Number of IO Device - S7 routing - Isochronous mode - S7 routing - S6 Routing - S6 Routing - S7 routing - S7 routing - S7 souting - S6 Routing - S6 Routing - S7 rou	-	
Services  - PG/OP communication Yes - S7 routing Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRP No - MRPD No - PROFINET IO Device Services - PG/OP communication - S7 routing Yes - PROFINET IO Devices mode - No - PROFINET IO Devices mode - PROFINE Index of Proper I		100 Mbit/s
PG/OP communication Yes S7 routing Yes Isochronous mode No Open IE communication Yes IRT No MRP No MRPD No PROFINET IO Devices Number of IO Devices that can be simultaneously activated/deactivated, max Updating time The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device S7 routing Yes Isochronous mode IRT No		
S7 routing Yes Isochronous mode No Open IE communication Yes IRT No IRT No MRP No MRPD No PROFINET IO Devices Services PG/OP communication S7 routing Yes No No PROFINET IO Devices mode Open IE communication Yes No No No No No No No PROFINET IO Device S7 routing No S7 routing No		Yes
- Isochronous mode - Open IE communication - IRT - MRP - MRP - MRPD - MRPD - PROFlenergy - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time - The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services - PG/OP communication - S7 routing - Isochronous mode - No		Yes
Open IE communication Yes IRT No MRP MRPP MRPD PROFlenergy Prioritized startup Prioritized startup Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Activation/deactivation of IO Devices Yes Number of IO Devices that can be simultaneously activated/deactivated, max Updating time Western Services PG/OP communication S7 routing Isochronous mode No -		No
- IRT No - MRP No - MRPD No - PROFlenergy No - Prioritized startup Yes - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Activation/deactivation of IO Devices Yes - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services - PG/OP communication Yes - S7 routing Yes - Isochronous mode No		Yes
- MRP - MRPD No - PROFlenergy No - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time - The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services - PG/OP communication - S7 routing - Isochronous mode  No		No
- MRPD - PROFlenergy - Prioritized startup - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time - The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services - PG/OP communication - S7 routing - Isochronous mode - No		No
Prioritized startup Prioritized startup Number of IO devices with prioritized startup, max.  Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max.  of which in line, max.  of which in line, max.  Activation/deactivation of IO Devices Number of IO Devices that can be simultaneously activated/deactivated, max.  Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  PG/OP communication Yes Services  No		No
- Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Of which in line, max of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services - PG/OP communication - S7 routing - Isochronous mode  Yes - Isochronous mode  No	— PROFlenergy	No
Number of IO devices with prioritized startup, max.  Number of connectable IO Devices, max.  Number of connectable IO Devices for RT, max.  of which in line, max.  of which in line, max.  Activation/deactivation of IO Devices  Number of IO Devices that can be simultaneously activated/deactivated, max.  Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  PG/OP communication S7 routing Isochronous mode  16  16  16  17  16  17  17  18  19  19  19  19  19  19  19  19  19		Yes
<ul> <li>Number of connectable IO Devices for RT, max.</li> <li>of which in line, max.</li> <li>Activation/deactivation of IO Devices</li> <li>Number of IO Devices that can be simultaneously activated/deactivated, max.</li> <li>Updating time</li> <li>The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.</li> </ul> PROFINET IO Device Services <ul> <li>PG/OP communication</li> <li>Yes</li> <li>S7 routing</li> <li>Isochronous mode</li> </ul> No	— Number of IO devices with prioritized	16
max.  — of which in line, max.  — Activation/deactivation of IO Devices  — Number of IO Devices that can be simultaneously activated/deactivated, max.  — Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  — PG/OP communication — S7 routing — Isochronous mode  No	Number of connectable IO Devices, max.	16
<ul> <li>— Activation/deactivation of IO Devices</li> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> <li>— Updating time</li> <li>The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.</li> <li>PROFINET IO Device</li> <li>Services</li> <li>— PG/OP communication</li> <li>— S7 routing</li> <li>— Isochronous mode</li> <li>Yes</li> <li>No</li> </ul>		16
— Number of IO Devices that can be simultaneously activated/deactivated, max.  — Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  — PG/OP communication — S7 routing — Isochronous mode  8	— of which in line, max.	16
simultaneously activated/deactivated, max.  — Updating time  The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  — PG/OP communication — S7 routing — Isochronous mode  No	<ul> <li>Activation/deactivation of IO Devices</li> </ul>	Yes
communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.  PROFINET IO Device  Services  - PG/OP communication - S7 routing - Isochronous mode  Yes No		8
Services  PG/OP communication Yes S7 routing Yes Isochronous mode No	— Updating time	communication component set for PROFINET IO, on the number
<ul> <li>— PG/OP communication</li> <li>— S7 routing</li> <li>— Isochronous mode</li> <li>Yes</li> <li>No</li> </ul>	PROFINET IO Device	
<ul><li>— S7 routing</li><li>— Isochronous mode</li><li>No</li></ul>	Services	
— Isochronous mode No	— PG/OP communication	Yes
	— S7 routing	Yes
— Open IE communication Yes	— Isochronous mode	No
	— Open IE communication	Yes

— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	2

Protocols		
Supports protocol for PROFINET IO	Yes	
PROFIBUS	Yes; CM 1243-5 required	
AS-Interface	Yes; CM 1243-2 required	
Protocols (Ethernet)		
• TCP/IP	Yes	
• DHCP	No	
• SNMP	Yes	
• DCP	Yes	
• LLDP	Yes	
Further protocols		
• MODBUS	Yes	

• MODBUS	Yes	
Communication functions		
S7 communication		
• supported	Yes	
• as server	Yes	
• as client	Yes	
<ul> <li>User data per job, max.</li> </ul>	See online help (S7 communication, user data size)	
Open IE communication		
• TCP/IP	Yes	
— Data length, max.	8 kbyte	
• ISO-on-TCP (RFC1006)	Yes	
— Data length, max.	8 kbyte	
• UDP	Yes	
— Data length, max.	1 472 byte	
Web server		
• supported	Yes	

Test commissioning functions		
Status/control		
Status/control variable	Yes	

16; dynamically

Yes

• User-defined websites

Number of connections

overall

• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	
Forcing		
• Forcing	Yes	
Diagnostic buffer		
• present	Yes	
Traces		
Number of configurable Traces	2	
<ul> <li>Memory size per trace, max.</li> </ul>	512 kbyte	
Interrupts/diagnostics/status information Diagnostics indication LED		
	Yes	
• RUN/STOP LED	Yes	
• ERROR LED		
MAINT LED	Yes	
Integrated Functions		
Number of counters	6	
Counting frequency (counter) max.	100 kHz	
Frequency meter	Yes	
controlled positioning	Yes	
Number of position-controlled positioning axes, max.	8	
Number of positioning axes via pulse-direction	4; With integrated outputs	
interface		
PID controller	Yes	
Number of alarm inputs	4	
Number of pulse outputs	4	
Limit frequency (pulse)	100 kHz	
Potential separation		
Potential separation digital inputs		
Potential separation digital inputs	No	
<ul> <li>between the channels, in groups of</li> </ul>	1	
Potential separation digital outputs		
Potential separation digital outputs	Yes	
• between the channels	No	
• between the channels, in groups of	1	
EMC		
Interference immunity against discharge of static electric		
<ul> <li>Interference immunity against discharge of static electricity acc. to IEC 61000-4-2</li> </ul>	Yes	
<ul> <li>Test voltage at air discharge</li> </ul>	8 kV	
<ul> <li>Test voltage at contact discharge</li> </ul>	6 kV	
Interference immunity to cable-borne interference		

<ul> <li>Interference immunity on supply lines acc. to IEC 61000-4-4</li> </ul>	Yes
<ul> <li>Interference immunity on signal cables acc. to IEC 61000-4-4</li> </ul>	Yes
Interference immunity against voltage surge	
• on the supply lines acc. to IEC 61000-4-5	Yes
Interference immunity against conducted variable distur	bance induced by high-frequency fields
<ul> <li>Interference immunity against high-frequency radiation acc. to IEC 61000-4-6</li> </ul>	Yes
Emission of radio interference acc. to EN 55 011	
Limit class A, for use in industrial areas	Yes; Group 1
• Limit class B, for use in residential areas	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011
Degree and class of protection	
Degree of protection acc. to EN 60529	
● IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	
Marine approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
<ul> <li>horizontal installation, min.</li> </ul>	-20 °C
<ul> <li>horizontal installation, max.</li> </ul>	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
Operation, min.	795 hPa

Operation, max.	1 080 hPa
Storage/transport, min.	660 hPa
Storage/transport, max.	1 080 hPa
permissible operating height	-1000 to 2000 m
Relative humidity	
permissible range (without condensation) at 25	95 %
°C	
Vibrations	
Vibrations	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
<ul> <li>Operation, tested according to IEC 60068-2-6</li> </ul>	Yes
Shock test	
• tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Extended ambient conditions	
Pollutant concentrations	
— SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Know-how protection	
<ul> <li>User program protection/password protection</li> </ul>	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
<ul><li>Protection level: Write protection</li></ul>	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
Cycle time monitoring	
• adjustable	Yes
Dimensions	
Width	110 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	415 g
last modified:	03/24/2017