Data sheet

6ES7211-1AE40-0XB0



SIMATIC S7-1200, CPU 1211C, compact CPU, DC/DC, onboard I/O: 6 DI 24 V DC; 4 DO 24 V DC; 2 AI 0-10 V DC, power supply: DC 20.4-28.8 V DC, program/data memory 75 KB

General information	
Product type designation	CPU 1211C DC/DC/DC
Firmware version	V4.6
Engineering with	
 Programming package 	STEP 7 V18 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
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Input current	
Current consumption (rated value)	300 mA; CPU only
Current consumption, max.	900 mA; CPU with all expansion modules
Inrush current, max.	12 A; at 28.8 V DC
l²t	0.5 A²·s
Output current	
for backplane bus (5 V DC), max.	750 mA; Max. 5 V DC for CM
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	8 W
Memory	
Work memory	
integrated	75 kbyte
Load memory	
• integrated	1 Mbyte
 Plug-in (SIMATIC Memory Card), max. 	with SIMATIC memory card
Backup	
• present	Yes
maintenance-free	Yes
without battery	Yes
CPU processing times	
for bit operations, typ.	0.08 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
ОВ	
Number, max.	Limited only by RAM for code
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	14 kbyte
Flag	
Size, max.	4 kbyte; Size of bit memory address area
Local data	
• per priority class, max.	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB
Address area	
Process image	
Inputs, adjustable	1 kbyte
Outputs, adjustable	1 kbyte
Hardware configuration	.,,,,
Number of modules per system, max.	3 communication modules, 1 signal board
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	100 0 month at 20 °C
Number of digital inputs	6; Integrated
of which inputs usable for technological functions	6; HSC (High Speed Counting)
Source/sink input	Yes
Number of simultaneously controllable inputs	165
all mounting positions	
— up to 40 °C, max.	6
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 current	15 V DC at 2.5 IIIA
• for signal "1", typ.	4 mA; nominal
Input delay (for rated value of input voltage)	4 IIIA, IIOIIIIIIai
for standard inputs	
·	0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 /
— parameterizable	0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— parameterizable	Yes
for technological functions	
— parameterizable	Single phase : 3 @ 100 kHz, differential: 3 @ 80 kHz
Cable length	
• shielded, max.	E00 E0 ()
• unshielded, max.	500 m; 50 m for technological functions
Digital outputs	300 m; for technological functions: No
Number of digital outputs	300 m; for technological functions: No
Number of digital outputs of which high-speed outputs	300 m; for technological functions: No 4 4; 100 kHz Pulse Train Output
Number of digital outputs of which high-speed outputs Limitation of inductive shutdown voltage to	300 m; for technological functions: No
Number of digital outputs • of which high-speed outputs Limitation of inductive shutdown voltage to Switching capacity of the outputs	300 m; for technological functions: No 4 4; 100 kHz Pulse Train Output L+ (-48 V)
Number of digital outputs of which high-speed outputs Limitation of inductive shutdown voltage to Switching capacity of the outputs with resistive load, max.	300 m; for technological functions: No 4 4; 100 kHz Pulse Train Output L+ (-48 V) 0.5 A
Number of digital outputs of which high-speed outputs Limitation of inductive shutdown voltage to Switching capacity of the outputs with resistive load, max. on lamp load, max.	300 m; for technological functions: No 4 4; 100 kHz Pulse Train Output L+ (-48 V)
Number of digital outputs of which high-speed outputs Limitation of inductive shutdown voltage to Switching capacity of the outputs with resistive load, max. on lamp load, max. Output voltage	300 m; for technological functions: No 4 4; 100 kHz Pulse Train Output L+ (-48 V) 0.5 A 5 W
Number of digital outputs of which high-speed outputs Limitation of inductive shutdown voltage to Switching capacity of the outputs with resistive load, max. on lamp load, max.	300 m; for technological functions: No 4 4; 100 kHz Pulse Train Output L+ (-48 V) 0.5 A

• for signal **I* rated value*		
Count delay with resistive load		0.5 A
• "1" to "1" max.	for signal "0" residual current, max.	0.1 mA
• "I' to "O", max. * Sunctions of gray outputs. • of the pulse outputs, with resistive load, max. * Number of relay outputs • Sheleford, max. • unshelded, max. • unshelded, max. • To "Ordage Number of analog inputs	Output delay with resistive load	
Sententing Requency of the pube outputs, with resistive load, max Relay subtate Number of rotary outputs O Cable length o shaleted, max. So 00 m o shaleted, max. ISD m Analog inputs Puber of analog reputs o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Yes o shaleted, max. Into fine or the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to both o range range (rated values), voltages o	• "0" to "1", max.	1 µs
e of the pulse outputs, with resistive load, max. Number of refety outputs Number of refety outputs Number of refety outputs Number of refety outputs Number of maked, max. So 00 m So 00	• "1" to "0", max.	5 μs
Relay supuls Number of retry outputs Number of retry outputs Number of ranks Number of	Switching frequency	
A lumber of relay outputs	of the pulse outputs, with resistive load, max.	100 kHz
A lumber of relay outputs	Relay outputs	
Cable length • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • unshielded, max. Number of analog inputs • Vottage vottage Yes	·	0
* shielded, max.		
- unshielded, max Number of analog inputs - Votage - Votage - Ves - Input resistance (0 to 10 V) - Zobic length - whelded, max - Votage - white length - whelded, max - Votage - Votage - Votage - Votage - Votage - Votage - Ves		500 m
Number of analog inputs 2 1 1 1 1 1 1 1 1 1		
Number of analog inputs Input ranges Yes		130 111
Input ranges • Voltage • Voltage • Oto +10 V Yes Input ranges (rated values), voltages • Oto +10 V Yes — Input resistance (0 to 10 V) Cable length • shelded, max — Analog outputs Number of analog outputs Number of analog outputs Number of analog outputs Analog value glueration for the inputs Inlegation and conversion time/resolution per channel • Resolution with overrange (thi including sign), max. • Inlegation and conversion time/resolution per channel • Resolution with overrange (thi including sign), max. • Conversion time (per channel) • Conversion time (per channel) • Connectable encoders • 2-wire sensor • 2-wire sensor • 1 Interface Interface type Interface type Ves Julianterface Interface type Autonogotiation Yes Autonogotiation Yes Autonogotiation Yes Autonogotiation Yes Autonogotiation Yes FROFINET (I) Controller • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s Senices • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s Senices • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s Senices • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s Senices • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller • Transmission rate, max. 100 Mbl/s • PROFINET (I) Controller		2
Evoltage Ves		2
Input ranges (rated values), voltages • 0 to +10 V Yes — Input resistance (0 to 10 V) ≥ ±100k ohms Cable length • shielded, max. Analog outputs Number of analog outputs Number of analog outputs Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. Integration inter, parameterizable • Conversion time (per channel) • Conversion time (per channel) • Conversion time (per channel) • Yes • Conversion time (per channel) • Yes • Conversion time (per channel) • Yes • Linterface Interface type		V
- 0 to +10 V		Yes
- Input resistance (0 to 10 V) Cable length		.,
e shielded, max. 100 m; twisted and shielded Analog outputs Number of analog outputs 0 Analog value seneration 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 type Interface type Interface type Interface type Interface type Autocrossing Yes Autocrossing Yes Autocrossing Yes Interface type • ROFINET • ROFINET • ROFINET • ROFINET OController • PROFINET IO Device • PROFINET IO Controller • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes • Media redundancy No PROFINET IO Communication • Yes; encryption with TLS V1.3 pre-selected No - IRT No - PROFINET MO - PROFILERERY - Promitized startup - Promitized startup - Promitized startup - Number of connectable IO Devices max Number of connectable IO Devices fr RT, max. 16		
		≥100k ohms
Analog outputs 0		
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 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 Interface Upe Interfa		100 m; twisted and shielded
Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration ime, parameterizable Conversion time (per channel) PROFINET Connectable encoders Ves Interface type Interface type Interface type Interface type Interface type Autocrossing Yes Autocrossing Yes Interface types Interface types Interface types Interface types Interface types PROFINET (D Controller Interface types PROFINET (D Controller PROFINET (D Device Yes SIMATIC communication Yes PROFINET (D Controller Media redundancy No PROFINET (D Controller Transmission rate, max. Services PROFInergy PROFInergy No PROFInergy Prioritized startup Prioritized startup Prioritized startup Prioritized startup Prioritized startup Prioritized startup No Prioritized startup No Number of connectable (D Devices, max. Number of connectable (D Devices, max. Number of connectable (D Devices, for RT, max. Number of connectable (D Devices, for RT, max. Number of connectable (D Devices, for RT, max. Number of connectable (D Devices, for RT, max. Number of connectable (D Devices, for RT, max. Number of connectable (D Devices, for RT, max. 16	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 type Interface type Interface type Selocition of transmission rate Autonogotiation Yes Autorossing Yes Interface (pipes Resolution with resolution of transmission rate Autorossing Yes Interface types PROFINET Isolated Autorossing Yes Interface types PROFINET IO Controller PROFINET IO Controller PROFINET IO Device Yes SIMATIC communication Yes Web server Media redundancy No PROFINET IO Controller Transmission rate, max. Services PROFINET IO Controller Interface types PROFINET IO Controller Yes Simanic communication Yes: Optionally also encrypted Web server Yes PROFINET IO Controller Interface types PROFINET IO Controller Yes: Optionally also encrypted Yes Services PROFINET IO Controller Interface types PROFINET IO Controller PROFINET IO Control	Number of analog outputs	0
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 Isolated Autonegotiation Autorossing Yes Autorossing Yes 1. Autorossing Yes 1. Resolution Autorossing Yes PROFINET Interface type Interface type Autorossing Yes Autorossing Yes Interface type PROFINET Interface type PROFINET Interface type PROFINET Interface type PROFINET Interface type PROFINET IO Controller Yes PROFINET IO Controller Yes SIMATIC communication Yes Open IE communication Yes; Optionally also encrypted Web server Yes Media redundancy No PROFINET IO Controller Transmission rate, max. Services PROF lenery PROF lenery PROF lenery Profitized startup Profitized startup Profitized startup No No PROF lenery Profitized startup No No PROF lenery Profitized startup No No PROF lenery Profitized startup No	Analog value generation for the inputs	
• Integration time, parameterizable	Integration and conversion time/resolution per channel	
• Integration time, parameterizable	 Resolution with overrange (bit including sign), max. 	10 bit
Encoder Connectable encoders • 2-wire sensor Yes 1. Interface Interface type Interface type Autonegotiation Autocrossing interface types • RJ 45 (Ethernet) • Interface types • ROFINET Ocntroller • PROFINET IO Controller • PROFINET IO Controller • PROFINET IO Controller • PROFINET IO Controller • Media redundancy • Media redundancy • Media redundancy • Media redundancy • PROFINET IO Controller • Transmission rate, max, Services - PG/OP communication • Yes; encryption with TLS V1.3 pre-selected - IRT - PROFlenergy • No Profitized startup - Number of IO devices with prioritized startup, max. - Number of IO devices with prioritized startup, max. - Number of IO devices with prioritized startup, max. - Number of connectable IO Devices, max. - Number of connectable IO Devices for RT, max. 16		Yes
Encoder Connectable encoders • 2-wire sensor Interface Interface type Isolated automatic detection of transmission rate Autoregotiation Autocrossing Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • Number of ports • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Wes • SIMATIC communication • Wes • Media redundancy • Media redundancy • PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication • Isochronous mode • No PROFINET IO Controller • Transmission rate, max. Services - PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication • Ves; Optionally also encrypted • Ves • Services - PG/OP communication • Ves; Optionally also encrypted • Ves • Media redundancy • No PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication • Ves; encryption with TLS V1.3 pre-selected • IRT • No • PROFinergy • No • No		
Connectable encoders • 2-wire sensor 1. Interface Interface type Interface type Interface type Interface type Interface type Automatic detection of transmission rate Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • Interface types • RJ 45 (Ethernet) • No Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Ves • SIMATIC communication • Web server • Media redundancy • Media redundancy PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services • PG/OP communication • Yes; encryption with TLS V1.3 pre-selected No - Isochronous mode - IRT - PROFlenergy - No - PROFlenergy - No - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max. 16 - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max.		
● 2-wire sensor Yes 1. Interface PROFINET Isolated Yes automatic detection of transmission rate Yes Autocrossing Yes Interface types Yes • RJ 45 (Ethernet) Yes • Number of ports 1 • Integrated switch No PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller *Transmission rate, max. • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes; encryption with TLS V1.3 pre-selected — IST No — PROFlenergy No — Prioritized startup Yes — Number of IO devices with prioritized startup, max. 16 — Number of connectable IO Devices, max. 16 — Number of connectable IO Devices for RT, max. 16		
Interface type Isolated Yes automatic detection of transmission rate Autoreoptiation Yes Autocrossing Yes Interface types • RJ 45 (Ethernet) Yes • Number of ports 1 • integrated switch No Protocols • PROFINET IO Controller Yes • SIMATIC communication Yes • Open IE communication Yes • Media redundancy No PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services - PG/OP communication Yes; encryption with TLS V1.3 pre-selected - ISOChronous mode - IRT No - PROFInery - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max.	CCIodubio dilocuolo	
Interface type PROFINET Isolated Yes automatic detection of transmission rate Yes Autonegotiation Yes Autocrossing Yes Interface types • RJ 45 (Eithernet) Yes • Number of ports 1 • integrated switch No Protocols • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services — PG/OP communication Yes; encryption with TLS V1.3 pre-selected — Isochronous mode — IRT No — PROFlenergy No — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max.	2-wire sensor	Yes
Isolated Yes automatic detection of transmission rate Yes Autoregoliation Yes Autocrossing Yes Interface types • RJ 45 (Ethernet) Yes • Number of ports 1 • integrated switch No Protocols • PROFINET IO Controller Yes • SIMATIC communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services - PG/OP communication Yes; encryption with TLS V1.3 pre-selected - IRT No - PROFIenergy 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. 16		Yes
automatic detection of transmission rate Autoreosing Autocrossing Yes Interface types • RJ 45 (Ethernet) • Number of ports • Integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication - Isochronous mode - IRT - PROFIenergy - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max.	1. Interface	
Autocrossing Autocrossing Yes Interface types RJ 45 (Ethernet) Number of ports Integrated switch No Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Web server Media redundancy No PROFINET IO Controller Yes Media redundancy No PROFINET IO Controller Yes Simatic communication Yes; Optionally also encrypted Web server Yes Media redundancy No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected No PROFlenergy PROFlenergy Proirtized startup Proirtized startup Proirtized startup No	1. Interface Interface type	PROFINET
Autocrossing Yes Interface types • RJ 45 (Ethernet) Yes • Number of ports 1 • integrated switch No Protocols • PROFINET IO Controller Yes • SIMATIC communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services - PG/OP communication Yes; encryption with TLS V1.3 pre-selected - IRT No - PROFIenergy No - Prioritized startup Yes - Number of IO devices with prioritized startup, max. 16 - Number of connectable IO Devices, max. 16 - Number of connectable IO Devices for RT, max. 16	1. Interface Interface type Isolated	PROFINET Yes
Interface types • RJ 45 (Ethernet) • Number of ports • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Yes • SIMATIC communication • Yes • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication - Isochronous mode - IRT - PROFIenergy - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Sumber of connectable IO Devices, max Number of connectable IO Devices for RT, max. 10 10 11 12 13 14 15 16 16 16 16 16 17 18 18 18 18 18 18 18 18 18	1. Interface Interface type Isolated automatic detection of transmission rate	PROFINET Yes Yes
R. 145 (Ethernet) Number of ports Number of ports Integrated switch No Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Yes Open IE communication Web server Media redundancy No PROFINET IO Controller Transmission rate, max. Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected IRT PROFlenergy PROFinergy Prioritized startup No Prioritized startup No	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation	PROFINET Yes Yes Yes
Number of ports integrated switch No Protocols PROFINET IO Controller PROFINET IO Device PROFINET IO Device SIMATIC communication Yes Open IE communication Yes; Optionally also encrypted Web server Media redundancy No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected IRT No PROFlenergy No Prioritized startup Prioritized startup Number of Od devices with prioritized startup, max. Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max.	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing	PROFINET Yes Yes Yes
integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected Isochronous mode No PROFINET PROFIenergy Prioritized startup Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Pess Provential Services Pess Provential Services Pess Pess Prioritized startup Pess Pumber of connectable IO Devices, max. Pumber of connectable IO Devices for RT, max.	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types	PROFINET Yes Yes Yes Yes Yes
Protocols PROFINET IO Controller PROFINET IO Device PROFINET IO Device SIMATIC communication Pession in Example 1 of the startup Web server Media redundancy No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected No IRT No PROFInergy 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. 16 Number of connectable IO Devices for RT, max. 16	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet)	PROFINET Yes Yes Yes Yes Yes
 PROFINET IO Controller PROFINET IO Device Yes SIMATIC communication Open IE communication Web server Media redundancy No PROFINET IO Controller Transmission rate, max. Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — 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. 	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports	PROFINET Yes Yes Yes Yes Yes
PROFINET IO Device SIMATIC communication Yes Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication No PROFINET PROFIenergy No Prioritized startup Prioritized startup No Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. 16 Number of connectable IO Devices for RT, max. 16	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports	PROFINET Yes Yes Yes Yes Yes 1
 SIMATIC communication Open IE communication Web server Media redundancy No PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — 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. 16 	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch	PROFINET Yes Yes Yes Yes Yes 1
Open IE communication Web server Web server Media redundancy No PROFINET IO Controller ▼Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes; encryption with TLS V1.3 pre-selected No IRT 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. Yes Yes; optionally also encrypted Yes No No No HET No N	1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	PROFINET Yes Yes Yes Yes Yes 1 No
Web server Media redundancy No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Isochronous mode IRT PROFIenergy 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. Yes Yes Yes No Yes; encryption with TLS V1.3 pre-selected No Your Yes No 16 16 Number of connectable IO Devices, max. 16 Number of connectable IO Devices for RT, max.	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller	PROFINET Yes Yes Yes Yes Yes 1 No
 Media redundancy PROFINET IO Controller Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — 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. 16 	Interface Interface type Isolated automatic detection of transmission rate Autoregotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
PROFINET IO Controller ● Transmission rate, max. 100 Mbit/s Services - PG/OP communication Yes; encryption with TLS V1.3 pre-selected - Isochronous mode No - IRT No - PROFlenergy No - Prioritized startup Yes - Number of IO devices with prioritized startup, max. 16 - Number of connectable IO Devices, max. 16 - Number of connectable IO Devices for RT, max. 16	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes
PROFINET IO Controller ● Transmission rate, max. 100 Mbit/s Services - PG/OP communication Yes; encryption with TLS V1.3 pre-selected - Isochronous mode No - IRT No - PROFlenergy No - Prioritized startup Yes - Number of IO devices with prioritized startup, max. 16 - Number of connectable IO Devices, max. 16 - Number of connectable IO Devices for RT, max. 16	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Ye
● Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — 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. 100 Mbit/s Yes; encryption with TLS V1.3 pre-selected No No No 16 16	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Ye
Services - PG/OP communication - Isochronous mode - IRT - 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. 16	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Ye
 — PG/OP communication — Isochronous mode — IRT — 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. 16 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
 — Isochronous mode — IRT — 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. 16 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
 — IRT — 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. 16 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services	PROFINET Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes No Mbit/s
 — 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. 16 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Isochronous mode	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max. 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — PROFIenergy	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted Yes No 100 Mbit/s Yes; encryption with TLS V1.3 pre-selected No No
— Number of connectable IO Devices for RT, max.	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — PROFIenergy — Prioritized startup	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — PROFIenergy — Prioritized startup — Number of IO devices with prioritized startup, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
— of which in line, max.	Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
	Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Transmission rate, max. Services PG/OP communication Isochronous mode IRT PROFIenergy Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be simultaneously 	8
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; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes
— Shared device	Yes
	2
Number of IO Controllers with shared device, max. Protocols	2
	Ver
Supports protocol for PROFINET IO	Yes
PROFISATE	No
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
OPC UA	Yes; OPC UA Server
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Redundancy mode	
Media redundancy	
— MRP	No
— MRPD	No
SIMATIC communication	
S7 routing	Yes
Open IE communication	
• TCP/IP	Yes
— Data length, max.	8 kbyte
 several passive connections per port, supported 	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	8 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
Web server	
• supported	Yes
User-defined websites	Yes
OPC UA	
Runtime license required	Yes; "Basic" license required
OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required
Application authentication	Available security policies: None, Basic128Rsa15, Basic256Rsa15,
— Application authentication	Basic256Sha256
— User authentication	"anonymous" or by user name & password
Number of sessions, max.	10
Number of subscriptions per session, max.	5
Sampling interval, min.	100 ms
Publishing interval, min.	200 ms
Number of server methods, max.	20
Number of server methods, max. Number of monitored items, recommended max.	1 000
	2
Number of server interfaces, max.	
 Number of nodes for user-defined server interfaces, max. 	2 000
Further protocols	
MODBUS	Yes
communication functions / header	
S7 communication	
O/ communication	

• supported	Yes
as server	Yes
• as client	Yes
User data per job, max.	See online help (S7 communication, user data size)
Number of connections	
overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved / 10 max; Total Connections: 34 reserved / 64 max
Test commissioning functions	
Status/control	
 Status/control variable 	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
Forcing	Yes
Diagnostic buffer	
• present	Yes
Traces	
 Number of configurable Traces 	2
 Memory size per trace, max. 	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Integrated Functions	
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs
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
 between the channels, in groups of 	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 electricity	
Interference immunity against discharge of static	Yes
electricity acc. to IEC 61000-4-2	
 Test voltage at air discharge 	8 kV
Test voltage at contact discharge	6 kV
Interference immunity to cable-borne interference	
 Interference immunity on supply lines acc. to IEC 61000- 4-4 	Yes
• Interference immunity on signal cables acc. to IEC 61000-	Yes
4-4 Interference immunity against voltage surge	
Interference infinitivadaliist voitage surge	Voc
, , , , , ,	Yes
 Interference immunity on supply lines acc. to IEC 61000- 4-5 	
• Interference immunity on supply lines acc. to IEC 61000-	ced by high-frequency fields
 Interference immunity on supply lines acc. to IEC 61000- 4-5 Interference immunity against conducted variable disturbance inducted variable disturbance inducted	ced by high-frequency fields Yes
Interference immunity on supply lines acc. to IEC 61000-4-5 Interference immunity against conducted variable disturbance induction Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	
Interference immunity on supply lines acc. to IEC 61000-4-5 Interference immunity against conducted variable disturbance induction. Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 Emission of radio interference acc. to EN 55 011	Yes
Interference immunity on supply lines acc. to IEC 61000-4-5 Interference immunity against conducted variable disturbance induction Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	

Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
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
 horizontal installation, min. 	-20 °C
 horizontal installation, max. 	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
Altitude during operation relating to sea level	
 Installation altitude, min. 	-1 000 m
 Installation altitude, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
 Operation, max. 	95 %; no condensation
Vibrations	
 Vibration resistance during operation acc. to IEC 60068- 2-6 	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
 Operation, tested according to IEC 60068-2-6 	Yes
Shock testing	
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
Pollutant concentrations	
SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
adjustable	Yes
Dimensions	
Width	90 mm

Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g

last modified: 3/12/2024 🖸