# **SIEMENS**

### Data sheet

## 6AG2214-1AG40-1XB0

SIPLUS S7-1200 CPU 1214C DC/DC/DC T1 RAIL -25 ... +55°C T1 with 70°C for 10 min with conformal coating based on 6ES7214-1AG40-0XB0 . compact CPU, DC/DC/DC, Onboard I/O: 14 "DI 24 V DC; 10 DO 24 V DC; 2 AI" 0-10 V DC, Power supply: 20.4-28.8V DC, Program/data memory 75 KB



General information	
Product type designation	CPU 1214C DC/DC/DC
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+	
<ul><li>Rated value (DC)</li></ul>	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 DC
Output current	
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
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
• 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	,
• Number, max.	Limited only by RAM for code
Data areas and their retentivity	
ata di cao ana troll lotoritivity	
Retentive data area (incl. timers, counters, flags), max.	10 kbyte
Retentive data area (incl. timers, counters, flags),	10 kbyte
Retentive data area (incl. timers, counters, flags), max.	10 kbyte  8 kbyte; Size of bit memory address area
Retentive data area (incl. timers, counters, flags), max. Flag	
Retentive data area (incl. timers, counters, flags), max.  Flag  • Number, max.	
Retentive data area (incl. timers, counters, flags), max.  Flag  • Number, max.  Local data  • per priority class, max.	8 kbyte; Size of bit memory address area  16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
Retentive data area (incl. timers, counters, flags), max.  Flag  • Number, max.  Local data  • per priority class, max.	8 kbyte; Size of bit memory address area  16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
Retentive data area (incl. timers, counters, flags), max.  Flag  • Number, max.  Local data  • per priority class, max.  Address area	8 kbyte; Size of bit memory address area  16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
Retentive data area (incl. timers, counters, flags), max.  Flag  • Number, max.  Local data  • per priority class, max.  Address area  Process image	8 kbyte; Size of bit memory address area  16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB
Retentive data area (incl. timers, counters, flags), max.  Flag  • Number, max.  Local data  • per priority class, max.  Address area  Process image  • Inputs, adjustable	8 kbyte; Size of bit memory address area  16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB

Time of day	
Clock	
Hardware clock (real-time)	Yes
Backup time	480 h; Typical
<ul><li>Deviation per day, max.</li></ul>	60 s/month at 25 °C
Digital inputs	
Number of digital inputs	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 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
<ul><li>of which high-speed outputs</li></ul>	4; 100 kHz Pulse Train Output
Limitation of inductive shutdown voltage to	L+ (-48 V)
Switching capacity of the outputs	
<ul><li>with resistive load, max.</li></ul>	0.5 A
● on lamp load, max.	5 W
Output voltage	
● for signal "0", max.	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V
Output current	

● for signal "1" rated value	0.5 A
<ul> <li>for signal "0" residual current, max.</li> </ul>	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.	100 kHz
Relay outputs	
Number of relay outputs	0
Cable length	
• shielded, max.	500 m
• unshielded, 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)	≥100k 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	
<ul> <li>Resolution with overrange (bit including sign),</li> </ul>	10 bit
max.	
Integration time, parameterizable	Yes
Conversion time (per channel)	625 µs
Encoder	
Connectable encoders	V
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
	Yes Yes
Isolated	
Isolated automatic detection of transmission rate	Yes

PROFINET IO Device Yes POPINET IO Device Yes Open IE communication Web server Yes PROFINET IO Controller  Transmission rate, max.  100 Mbit/s Services  Number of connectable IO Devices, max. PROFINET IO Device Services  Services  Services  Supports of IO Controllers with shared device, max. Protocols  Supports protocol for PROFINET IO PROFINET OF PROFINET IO PROFIDUS AS Interface Protocols (Ethernet) TOPIP Protocols (Ethernet) TOPIP Pes ISO-on-TCP (RFC1006) Upp Yes PROFIDUS Yes Upports device, was in the protocol of the protocols of the protocols (Ethernet) Topin Iso-on-TCP (RFC1006) Upp Yes Further protocols  MODBUS  Communication functions  Sommunication Ves Sommunication Ves Sommunication Sommunication Ves Sommunication Ves Sommunication Ves Sommunication Ves Sommunication (Incitons) Sommunication Ves Sommunication Ves Sommunication (Incitons) Sommunication Ves Sommunication Ve		
Open IE communication Web server PROFINET IO Controller Transmission rate, max.  Services — Number of connectable IO Devices, max.  PROFINET IO Device Services — Number of IO Controllers with shared device, max.  Protocols Supports protocol for PROFINET IO PROFIBUS AS-interface Protocols (Ethernet) TCP/IP Open IE communication TCP/IP Services  - Supports Suppo	<ul> <li>PROFINET IO Controller</li> </ul>	Yes
Web server  PROFINET IO Controller  Transmission rate, max.  Services  — Number of connectable IO Devices, max.  PROFINET IO Device  Services  — Shared device — Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO PROFIBUS  AS-Interface Protocols (Ethernet)  • TCP/IP Open IE communication • TCP/IP • ISO-an-TCP (RFC1006) • UDP  Web server  • supported • User-defined websites  Further protocols  Further protocols  Communication functions  Status/control  • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control • Status/control variable • Variables    Ves   Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters   Communication functions   Communication functions   Status/control • Ves   Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters   Communication functions   Communication functions   Communication functions   Status/control • Status/control • Status/control • Status/control • Status/control • Variables   Status/control • Variables   Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	PROFINET IO Device	Yes
PROFINET IO Controller  In Transmission rate, max. Services  Number of connectable IO Devices, max.  PROFINET IO Device  Services  Services  Services  Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO PROFIBUS  AS-Interface Yes  Protocols (Ethernet)  TCP/IP  Ves  Open IE communication  TCP/IP  Ves  Ves  Ves  Ves  Ves  Ves  Ves  Ve	Open IE communication	Yes
Transmission rate, max.  Services  - Number of connectable IO Devices, max.  PROFINET IO Device  Services  - Shared device - Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO Yes PROFIBUS AS-Interface Protocols (Ethernet)  - TCP/IP Open IE communication  - TCP/IP Open IE communication  - TCP/IP (SiO-on-TC/RFC1006) - UDP Yes  Web server  - supported - User-defined websites - Yes  Further protocols - MODBUS  Yes  Communication  - supported - as server - as a client - as server - as a client - Yes  Number of connections  Status/control variable - Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Web server	Yes
Services  - Number of connectable IO Devices, max.  PROFINET IO Device  Services  - Shared device - Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO PROFIBUS Yes; CM 1243-5 required  AS-Interface Protocols (Ethernet)  • TCP/IP • TCP/IP • ISO-on-TCP (RFC1006) • UDP Yes  Web server • supported • User-defined websites  Futher protocols  • MODBUS  Communication  • supported • user-defined websites  Futher protocols  • MODBUS  Yes  Communication  • supported • as server • as client • as client  Number of connections • overall  Test commissioning functions  Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	PROFINET IO Controller	
- Number of connectable IO Devices, max.  PROFINET IO Device  Services  - Shared device	Transmission rate, max.	100 Mbit/s
PROFINET IO Device  Services  — Shared device — Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO PROFIBUS AS-Interface Protocols (Ethernet)  • TCP/IP • Yes  Open IE communication  • TCP/IP • ISO-on-TCP (RFC1006) • UDP • Yes  Web server • supported • User-defined websites  Further protocols • MODBUS  Formunication  • Yes  Communication  • supported • as server • as client  Number of connections • overall  Test commissioning functions  Status/control • Status/control variable • Variables  I res  I yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Services	
Services	Number of connectable IO Devices, max.	16
Shared device Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO PROFIBUS AS-Interface Protocols (Ethernet)  • TCP/IP Pyes Popen IE communication • TCP/IP P(SO-on-TCP (RFC1006) Puber very  • Supported Puber very  • Subscript very  • Subs	PROFINET IO Device	
Number of IO Controllers with shared device, max.  Protocols  Supports protocol for PROFINET IO Yes PROFIBUS Yes; CM 1243-5 required  AS-Interface Yes Protocols (Ethernet)  • TCP/IP Yes Open IE communication  • TCP/IP Yes • ISO-on-TCP (RFC1006) Yes • UDP Yes Web server  • supported Yes  Further protocols  • MODBUS Yes  Further protocols  • MODBUS Yes  Sommunication  • supported Yes • as server Yes • as client Yes Number of connections  • overall 16; dynamically  Test commissioning functions  Status/control  • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Services	
Protocols  Supports protocol for PROFINET IO PROFIBUS AS-Interface Protocols (Ethernet)  • TCP/IP Poper IE communication  • TCP/IP Pose Ves Pose Ves Pose Ves Pose Ves Protocols (Ethernet)  • TCP/IP Poper IE communication  • TCP/IP Poper IE communication  • TCP/IP Poper IE communication  • UDP Pose Ves Pose V	— Shared device	Yes
Supports protocol for PROFINET IO PROFIBUS Yes; CM 1243-5 required AS-Interface Yes Protocols (Ethernet) • TCP/IP Yes Open IE communication • TCP/IP (ISO-on-TCP (RFC1006) • UDP Yes Web server • supported • User-defined websites Further protocols • MODBUS Yes  Communication • supported Yes Yes  Communication • supported Yes  Yes  Test communication  • overall  16; dynamically  Test commissioning functions  Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters		2
PROFIBUS  AS-Interface  Protocols (Ethernet)  TCP/IP  Ves  Open IE communication  TCP/IP  ISO-on-TCP (RFC1006)  UDP  Ves  Web server  Supported  User-defined websites  Further protocols  MODBUS  Yes  Communication functions  S7 communication  Sy supported  as server  as client  Yes  Number of connections  Status/control  Status/control  Status/control variable  Ves  Ves  Ves  Ves  Ves  Ves  Ves  V	Protocols	
AS-Interface Yes  Protocols (Ethernet)  • TCP/IP Yes  Open IE communication  • TCP/IP Yes  • ISO-on-TCP (RFC1006) Yes  • UDP Yes  Web server  • supported Yes  • User-defined websites Yes  Further protocols  • MODBUS Yes  Communication functions  \$7 communication  • supported Yes  • as server Yes  • as client Yes  Number of connections  • overall 16; dynamically  Test commissioning functions  Status/control variable  • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters		Yes
Protocols (Ethernet)  • TCP/IP  • TCP/IP  Open IE communication  • TCP/IP  • ISO-on-TCP (RFC1006)  • UDP  Yes  Web server  • supported  • User-defined websites  Further protocols  • MODBUS  Yes  Communication functions  S7 communication  • supported  • sa server  • as client  Yes  Number of connections  • overall  Test commissioning functions  Status/control  • Status/control  • Status/control variable  • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	PROFIBUS	Yes; CM 1243-5 required
TCP/IP  Open IE communication  TCP/IP  ISO-on-TCP (RFC1006) UDP  Yes  Web server  supported User-defined websites  Further protocols  MODBUS  Yes  Tommunication  supported Yes  Yes  Yes  Further protocols  MODBUS  Yes  Tommunication  ST communication  Yes  ST communication  Yes  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	AS-Interface	Yes
Open IE communication  • TCP/IP  • ISO-on-TCP (RFC1006)  • UDP  Yes  Web server  • supported  • User-defined websites  Further protocols  • MODBUS  Yes  Communication functions  S7 communication  • supported  • as server  • as client  Number of connections  • overall  Test commissioning functions  Status/control  • Status/control  • Status/control variable  • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Protocols (Ethernet)	
TCP/IP ISO-on-TCP (RFC1006) Ves UDP Yes  Web server  supported User-defined websites Yes  Further protocols MODBUS Yes  Communication functions  S7 communication  supported Sa server Sa sclient Yes  ves  Number of connections  overall  Test commissioning functions  Status/control  Status/control  Status/control  Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• TCP/IP	Yes
ISO-on-TCP (RFC1006) UDP Yes  Web server  Supported User-defined websites Yes  Further protocols MODBUS Yes  Communication functions  \$7 communication  Status/control  Status/control  Status/control  Status/control  Yes  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters  Pes  Ves  Ves  Yes  Augustation  Yes  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Open IE communication	
UDP  Web server  supported User-defined websites  Further protocols  MODBUS  Yes  Communication functions  S7 communication  supported sa server as client  Number of connections  overall  Test commissioning functions  Status/control  Status/control  Status/control  Status/control variable Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• TCP/IP	Yes
Web server  • supported • User-defined websites  Further protocols • MODBUS  Communication functions  \$7 communication  • supported • as server • as client  Number of connections  • overall  Test commissioning functions  Status/control • Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• ISO-on-TCP (RFC1006)	Yes
supported     User-defined websites     Yes  Further protocols     MODBUS  Communication functions  S7 communication      supported     Yes     as server     as client  Number of connections      overall  Test commissioning functions  Status/control  Status/control  Status/control variable     Ves  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters  Overall  Statis / Outputs, memory bits, DBs, distributed I/Os, timers, counters	• UDP	Yes
User-defined websites  Further protocols  MODBUS  Yes  Communication functions  S7 communication  supported  supported  as server  as client  Number of connections  overall  Test commissioning functions  Status/control  Status/control  Pes  Variables  Ves  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Web server	
Further protocols  • MODBUS  Yes  Communication functions  S7 communication  • supported • as server • as client  Number of connections  • overall  Test commissioning functions  Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• supported	Yes
MODBUS  Communication functions  S7 communication      supported     supported     as server     as client  Number of connections      overall  Test commissioning functions  Status/control  Status/control  Status/control variable     Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	<ul> <li>User-defined websites</li> </ul>	Yes
Communication functions  S7 communication  • supported • as server • as client  Number of connections • overall  Test commissioning functions  Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Further protocols	
S7 communication  • supported • as server • as client  Number of connections • overall  Test commissioning functions  Status/control • Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• MODBUS	Yes
S7 communication  • supported • as server • as client  Number of connections • overall  Test commissioning functions  Status/control • Status/control • Status/control variable • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Communication functions	
<ul> <li>as server</li> <li>as client</li> <li>Yes</li> <li>Number of connections</li> <li>overall</li> <li>16; dynamically</li> <li>Test commissioning functions</li> <li>Status/control</li> <li>Status/control variable</li> <li>Variables</li> <li>Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters</li> </ul>		
<ul> <li>as client</li> <li>Number of connections</li> <li>overall</li> <li>16; dynamically</li> <li>Test commissioning functions</li> <li>Status/control</li> <li>Status/control variable</li> <li>Variables</li> <li>Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters</li> </ul>	• supported	Yes
Number of connections  • overall  16; dynamically  Test commissioning functions  Status/control  • Status/control variable  • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• as server	Yes
<ul> <li>overall</li> <li>Test commissioning functions</li> <li>Status/control</li> <li>Status/control variable</li> <li>Variables</li> <li>Variables</li> <li>Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters</li> </ul>	• as client	Yes
Test commissioning functions  Status/control  • Status/control variable  • Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Number of connections	
Status/control  Status/control variable  Variables  Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	• overall	16; dynamically
<ul> <li>Status/control variable</li> <li>Variables</li> <li>Variables</li> <li>Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters</li> </ul>		
<ul> <li>Variables</li> <li>Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters</li> </ul>		Voo
counters		
Forcing	<ul><li>Variables</li></ul>	
	Forcing	

Present Yes Present Yes Traces  Number of configurable Traces  Substituting tequency (counter) max. Frequency measurement Prequency measurement Prequency measurement Prequency present Agents and the state of the s	• Forcing	Yes
Traces  Number of configurable Traces  100 kHz  Frequency measurement Frequency fount of positioning axes, max.  Number of positioning axes via pulse-direction interface File Controller Frequency founts Frequency (pulse) Frequency	Diagnostic buffer	
Number of configurable Traces  2; Up to 512 KB of data per trace are possible  Integrated Functions  Number of counters  6 Counting frequency (counter) max.  100 kHz Frequency measurement  controlled positioning  Yes Number of positioning axes via pulse-direction interface  PID controller  Yes Number of positioning axes via pulse-direction interface  PID controller  Yes Number of alarm inputs  4 Number of palse outputs  4 Limit frequency (pulse)  Potential separation  Potential separation digital inputs  • Potential separation digital inputs  • Detential separation digital outputs  • Potential sepa	• present	Yes
Number of counters 6 Counting frequency (counter) max. 100 kHz Frequency measurement Yes Controlled positioning Yes Number of position-controlled positioning axes, max. 8 Number of position-controlled positioning axes wia pulse-direction interface PID controller Yes Number of alarm inputs 4 Number of alarm inputs 4 Number of pulse outputs 4 Limit frequency (pulse) 100 kHz  Potential separation Potential separation digital inputs 500V AC for 1 minute    • Potential separation digital outputs 1  • Potential separation digital outputs 9 • Detential separation digital outputs 1  • Detential separation digital outpu	Traces	
Number of counters 6 Counting frequency (counter) max. 100 kHz Frequency measurement Yes Countrolled positioning Yes Number of position-controlled positioning axes, max. 8 Number of positioning axes via pulse-direction interface PID controller Yes Number of alarm inputs 4 Number of palse outputs 4 Number of pulse outputs 4 Limit frequency (pulse) 100 kHz  Potential separation digital inputs 500V AC for 1 minute   • Potential separation digital outputs 1  • Potential separation digital outputs Yes • Potential separation digital outputs No   • Potential separation digital outputs 1 • Potential separation digital outputs Yes • between the channels, in groups of 1  Potential separation digital outputs Yes • between the channels No   • between the channels in groups of 1  Isolation tested with According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity   • Interference immunity against discharge of static electricity acc. to IEC 61000-4-2   — Test voltage at air discharge   • Interference immunity to cable-borne interference   • Interference immunity to against outple sacc. to IEC 61000-4-4   • Interference immunity on supply lines acc. to IEC 61000-4-5    • Interference immunity against voltage surge   • Interference immunity on supply lines acc. to IEC 61000-4-5	Number of configurable Traces	2; Up to 512 KB of data per trace are possible
Counting frequency (counter) max.  Frequency measurement Frequency measurement Frequency measurement Frequency measurement Frequency fositioning Frequency fositioning axes, max.  Number of positioning axes via pulse-direction interface FID controller Final frequency found in inputs Frequency (pulse)	Integrated Functions	
Frequency measurement Yes controlled positioning Yes Number of position-controlled positioning axes, max. Number of positioning axes via pulse-direction 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 500V AC for 1 minute • between the channels, in groups of 1  Potential separation digital outputs Yes • between the channels, in groups of 1  Potential separation digital outputs Yes • between the channels, in groups of 1  Solution Isolation tested with According to EN 50155 (routline test)  EMC  Interference immunity against discharge of static electricity • Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 — Test voltage at air discharge	Number of counters	6
Controlled positioning Number of position-controlled positioning axes, max.  Number of positioning axes via pulse-direction interface PID controller Yes Number of alarm inputs Aumber of pulse outputs Limit frequency (pulse) 100 kHz  Potential separation Potential separation digital inputs • Potential separation digital inputs • between the channels, in groups of • Potential separation digital outputs • Po	Counting frequency (counter) max.	100 kHz
Number of position-controlled positioning axes, max.  Number of positioning axes via pulse-direction interface  PID controller  Number of alarm inputs  A	Frequency measurement	Yes
Number of positioning axes via pulse-direction interface  PID controller  Number of alarm inputs  Aumber of pulse outputs  Limit frequency (pulse)  Potential separation  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital outputs  Potential separati	controlled positioning	Yes
interface PID controller PID controller Number of alarm inputs 4 Number of pulse outputs 4 Limit frequency (pulse) Potential separation Potential separation digital inputs • Potential separation digital inputs • Detential separation digital inputs • Detential separation digital inputs • Detential separation digital outputs • Potential separation digital outputs • Detween the channels, in groups of • Detween the channels • between the channels • between the channels, in groups of 1  Isolation  Isolation  Isolation  Interference immunity against discharge of static electricity • Interference immunity against discharge of static electricity at co. to IEC 61000-4-2 — Test voltage at air discharge • Interference immunity to cable-borne interference • Interference immunity on supply lines acc. to IEC 61000-4-4 • Interference immunity on signal cables acc. to IEC 61000-4-5  Interference immunity against voltage surge • Interference immunity against voltage surge • Interference immunity on supply lines acc. to IEC 61000-4-5	Number of position-controlled positioning axes, max.	8
Number of alarm inputs  Number of pulse outputs  It imit frequency (pulse)  Potential separation  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital outputs  Potential sepa		4; With integrated DO
Number of pulse outputs 4  Limit frequency (pulse) 100 kHz  Potential separation  Potential separation digital inputs 500V AC for 1 minute 6 6 between the channels, in groups of 1  Potential separation digital outputs 7 6 between the channels, in groups of 1  Potential separation digital outputs 8 6 between the channels 8 6 between the channels 9 7 between the channels 9 7 between the channels 9 7 between the channels, in groups of 1  Isolation  Isolation  Isolation tested with According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge 6 kV  Interference immunity 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 to cable-borne interference  Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity against voltage surge  Interference immunity against voltage surge	PID controller	Yes
Limit frequency (pulse)  Potential separation  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital inputs  Potential separation digital outputs  Potential separation  No  According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity according to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity to cable-borne interference  Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity against voltage surge  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5	Number of alarm inputs	4
Potential separation  Potential separation digital inputs  • Potential separation digital inputs  • between the channels, in groups of  • Potential separation digital outputs  • between the channels  • between the channels  • between the channels, in groups of  1  Isolation  Isolation  Interference immunity against discharge of static electricity  • Interference immunity against discharge of static electricity  • Interference immunity against discharge of static electricity  • Interference immunity against discharge  • Interference immunity on tischarge  • Interference immunity on supply lines acc. to IEC 61000-4-4  • Interference immunity on supply lines acc. to IEC 61000-4-4  • Interference immunity against voltage surge  • Interference immunity against voltage surge  • Interference immunity on supply lines acc. to IEC 61000-4-5	Number of pulse outputs	4
Potential separation digital inputs  Potential separation digital inputs between the channels, in groups of  Potential separation digital outputs  Potential separation digital inputs  Potential separation digital outputs  Potential separation digital outputes  Potential separation digital separation  Potential separation digital separation	Limit frequency (pulse)	100 kHz
Potential separation digital inputs between the channels, in groups of  Potential separation digital outputs  Potential separation digital inputs  Potential separation digital outputs  Po	Potential separation	
between the channels, in groups of Potential separation digital outputs      Potential separation digital outputs     between the channels     between the channels     between the channels, in groups of  Isolation  Isolation  Isolation tested with  According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge  Interference immunity on IEC 61000-4-2  Test voltage at air discharge  Interference immunity to cable-borne interference  Interference immunity to cable-borne interference  Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity on supply lines acc. to IEC 61000-4-5	Potential separation digital inputs	
Potential separation digital outputs  No  Potential separation digital outputs  Potential separation digital outputs  Potential separation digital outputs  Potential separation digital outputs  Potential separation digital se	Potential separation digital inputs	500V AC for 1 minute
Potential separation digital outputs between the channels between the channels, in groups of  Isolation  Isolation  Isolation tested with  According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity acc. to IEC 61000-4-2  — Test voltage at air discharge B kV  — Test voltage at contact discharge Interference immunity to cable-borne interference  Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5	<ul> <li>between the channels, in groups of</li> </ul>	1
between the channels     between the channels, in groups of  Isolation  Isolation  Isolation tested with According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge of static 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  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity on supply lines acc. to IEC 61000-4-5	Potential separation digital outputs	
between the channels, in groups of  Isolation  Isolation tested with  According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge of static 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  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5	Potential separation digital outputs	Yes
Isolation  Isolation tested with According to EN 50155 (routine test)  EMC  Interference immunity against discharge of static electricity  • Interference immunity against discharge of static 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  • Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  • Interference immunity on supply lines acc. to IEC 61000-4-5	• between the channels	No
Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge of static electricity  Interference immunity against discharge of static 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  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity on supply lines acc. to IEC 61000-4-5	<ul> <li>between the channels, in groups of</li> </ul>	1
Interference immunity against discharge of static electricity  Interference immunity against discharge of static 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  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to Yes	Isolation	
Interference immunity against discharge of static electricity  Interference immunity against discharge of static 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  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity against voltage surge		According to EN 50155 (routine test)
Interference immunity against discharge of static 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  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity on supply lines acc. to Yes	EMC	
static 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  • Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  • Interference immunity on supply lines acc. to IEC 61000-4-5  Yes	Interference immunity against discharge of static electri	city
— Test voltage at contact discharge 6 kV  Interference immunity to cable-borne interference  Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Yes	, ,	Yes
Interference immunity to cable-borne interference  Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Interference immunity on supply lines acc. to IEC 61000-4-5	— Test voltage at air discharge	8 kV
Interference immunity on supply lines acc. to IEC 61000-4-4  Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  Interference immunity on supply lines acc. to IEC 61000-4-5  Yes  Yes	Test voltage at contact discharge	6 kV
IEC 61000-4-4  • Interference immunity on signal cables acc. to IEC 61000-4-4  Interference immunity against voltage surge  • Interference immunity on supply lines acc. to IEC 61000-4-5  Yes  Yes	Interference immunity to cable-borne interference	
IEC 61000-4-4  Interference immunity against voltage surge  ● Interference immunity on supply lines acc. to IEC 61000-4-5  Yes		Yes
• Interference immunity on supply lines acc. to Yes IEC 61000-4-5		Yes
IEC 61000-4-5	Interference immunity against voltage surge	
Interference immunity against conducted variable disturbance induced by high-frequency fields		Yes
	Interference immunity against conducted variable distur	bance induced by high-frequency fields

• Interference immunity against high-frequency radiation acc. to IEC 61000-4-6

Yes

#### Emission of radio interference acc. to EN 55 011

Limit class A, for use in industrial areas

• Limit class B, for use in residential areas

Yes; Group 1

Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011

#### Degree and class of protection

IP degree of protection

IP20

#### Standards, approvals, certificates

# Railway application

EN 50121-3-2
 Yes; EMC for rail vehicles
 EN 50121-4
 Yes; EMC for signal and telecommunications systems

• EN 50124-1 Yes; Railway applications - overvoltage category OV2; pollution

degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC

EN 50125-1
 Yes; Rail vehicles - see ambient conditions

• EN 50125-2 Yes; Stationary electrical equipment - see ambient conditions

• EN 50125-3 Yes; Signal and telecommunications systems - see ambient

conditions; vibrations and shocks: Application point outside of

tracks (1 m to 3 m away from track)

• EN 50155

Yes; Rail vehicles - temperature class T1, horizontal mounting

position, salt spray Class ST2

• EN 61373 Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B

• Fire protection acc. to EN 45545-2 Yes; Rail vehicles - verification on request

#### Ambient conditions

#### Free fall

• Fall height, max.

0.3 m; five times, in product package

#### Ambient temperature during operation

• horizontal installation, min.

-25 °C; = Tmin (incl. condensation/frost)

• horizontal installation, max.

60 °C; Number of simultaneously activated inputs or outputs: 7 or 5 (no adjacent points) at 60 °C horizontal, 14 or 10 at 55 °C horizontal; 70 °C for 10 minutes (T1 acc. to EN 50155)

#### Ambient temperature during storage/transportation

• min.

-40 °C

• max.

70 °C

#### Altitude during operation relating to sea level

• Installation altitude above sea level, max.

2 000 m

• Ambient air temperature-barometric pressure-

Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

# altitude Relative humidity

• With condensation, tested in accordance with IEC 60068-2-38, max.

100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

#### Vibrations

<ul> <li>Vibration resistance during operation acc. to IEC 60068-2-6</li> </ul>	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 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
Resistance	
Coolants and lubricants	
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); $^{\star}$
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose	vehicles
<ul> <li>to biologically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
<ul> <li>to mechanically active substances according to EN 60721-3-5</li> </ul>	Yes; Class 5S3 incl. sand, dust; *
Usage in industrial process technology	
<ul> <li>Against chemically active substances acc.</li> <li>to EN 60654-4</li> </ul>	Yes; Class 3 (excluding trichlorethylene)
<ul> <li>Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04</li> </ul>	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
Remark	
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high reliability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
<ul> <li>Electronic equipment on rolling stock acc. to EN 50155</li> </ul>	Yes; Class PC2 protective coating acc. to EN 50155:2017
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Cycle time monitoring	
adjustable	Yes
Dimensions	
Width	110 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	415 g
Other	
Note:	for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776
last modified:	05/28/2020