# **SIEMENS**

## Data sheet

## 6ES7214-1HG40-0XB0

SIMATIC S7-1200, CPU 1214C, compact CPU, DC/DC/relay, onboard I/O: 14 DI 24 V DC; 10 DO relay 2 A; 2 AI 0-10 V DC, Power supply: DC 20.4-28.8V DC, Program/data memory 100 KB



General information	
Product type designation	CPU 1214C DC/DC/relay
Firmware version	V4.4
Engineering with	
<ul> <li>Programming package</li> </ul>	STEP 7 V16 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+	
<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
l²t	0.8 A <sup>2</sup> ·s
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.
• Z4 V	
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	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
OB	Limited only by DAM for code
• Number, max.	Limited only by RAM for code
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags),	10 kbyte
max.	
Flag	9 khuta: Siza of hit moment address area
Number, max.	8 kbyte; Size of bit memory address area
Local data	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
<ul> <li>per priority class, max.</li> </ul>	to 26: 6 KB
Address area	
Process image	

• Outputs, adjustable       1 kbyte         Hardware configuration       3 comm. modules, 1 signal board, 8 signal modules         Time of day       3 comm. modules, 1 signal board, 8 signal modules         Clock       •         • Hardware clock (real-time)       Yes         • Backup time       480 h; Typical         • Deviation per day, max.       ±60 s/month at 25 °C         Digital inputs       14; Integrated         • of which inputs usable for technological functions       6; HSC (High Speed Counting)         Source/sink input       Yes         Number of simultaneously controllable inputs       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)       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         - parameterizable       0.2 ms       2 ms         - at "0" to "1", max.       12.8 ms         for interrupt inputs       - at "0" to "1", max.         - parameterizable       Yes	<ul> <li>Inputs, adjustable</li> </ul>	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         • Of which inputs usable for technological functions         • of which inputs usable for technological functions       14; Integrated         Source/sink input       Yes         Number of simultaneously controllable inputs       14         Input voltage       • exted value (DC)       24 V         • for signal "0"       5 V DC at 1 mA         • for signal "0"       5 V DC at 2.5 mA         Input delay (for rated value of input voltage)       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", max.       12.8 ms         for interrupt inputs       12.8 ms		
Number of modules per system, max.       3 comm. modules, 1 signal board, 8 signal modules         Time of day         Clock       • Hardware clock (real-time)         • Backup time       480 h; Typical         • Deviation per day, max.       ±60 s/month at 25 °C         Digital inputs       14; Integrated         • of which inputs usable for technological functions       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       § V DC at 1 mA         • for signal "0"       5 V DC at 2.5 mA         Input delay (for rated value of input voltage)       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", max.       12.8 ms		
Time of day         Clock <ul> <li>Hardware clock (real-time)</li> <li>Yes</li> <li>Backup time</li> <li>480 h; Typical</li> <li>Deviation per day, max.</li> <li>±60 s/month at 25 °C</li> </ul> Digital inputs <ul> <li>140 s/month at 25 °C</li> </ul> Digital inputs <li>141 inputs usable for technological functions</li> <li>of which inputs usable for technological functions</li> <li>Source/sink input</li> <li>Yes</li> Number of signultaneously controllable inputs <ul> <li>142 input voltage</li> <li>- up to 40 °C, max.</li> <li>143 input voltage</li> <li>Rated value (DC)</li> <li>24 V</li> <li>for signal "0"</li> <li>5 V DC at 1 mA</li> <li>5 V DC at 2.5 mA</li> </ul> Input delay (for rated value of input voltage) <ul> <li>for signal "1"</li> <li>15 V DC at 2.5 mA</li> </ul> Input delay (for rated value of input voltage) <li>for standard inputs</li> <li>- parameterizable</li> <li>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</li> <li>- at "0" to "1", max.</li> <li>12.8 ms</li>		
Clock <ul> <li>Hardware clock (real-time)</li> <li>Backup time</li> <li>Backup time</li> <li>Backup time</li> <li>Deviation per day, max.</li> <li>for stigital inputs</li> <li>of which inputs usable for technological functions</li> <li>Source/sink input</li> <li>Yes</li> <li>Number of simultaneously controllable inputs</li> <li>all mounting positions</li> <li>— up to 40 °C, max.</li> <li>14</li> <li>Input voltage</li> <li>Rated value (DC)</li> <li>24 V</li> <li>for signal "0"</li> <li>5 V DC at 1 mA</li> <li>for signal "1"</li> <li>15 V DC at 2.5 mA</li> <li>Input delay (for rated value of input voltage)</li> <li>for standard inputs</li> <li>— at "0" to "1", min.</li> <li>— at "0" to "1", max.</li> <li>12.8 ms</li> <li>for interrupt inputs</li> <li>Yes</li> <li>Yes</li></ul>	Number of modules per system, max.	3 comm. modules, 1 signal board, 8 signal modules
Hardware clock (real-time)       Yes         Backup time       480 h; Typical         • Deviation per day, max.       460 s/month at 25 °C         Digital inputs       14; Integrated         • of which inputs usable for technological functions       6; HSC (High Speed Counting)         Source/sink input       Yes         Number of simultaneously controllable inputs       14         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       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	Time of day	
<ul> <li>Backup time</li> <li>Deviation per day, max.</li> <li>Backup time</li> <li>Deviation per day, max.</li> <li>Backup time</li> <li>Also h; Typical</li> <li>to be visual to be visual</li></ul>	Clock	
• Deviation per day, max.       ±60 s/month at 25 °C         Digital inputs       14; Integrated         • of which inputs usable for technological functions       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       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)       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       12.8 ms	<ul> <li>Hardware clock (real-time)</li> </ul>	Yes
Digital inputs       14; Integrated         • of which inputs usable for technological functions       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       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)       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	<ul> <li>Backup time</li> </ul>	480 h; Typical
Number of digital inputs       14; Integrated         • of which inputs usable for technological functions       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       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)       6r 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", max.       12.8 ms         for interrupt inputs       12.8 ms	<ul> <li>Deviation per day, max.</li> </ul>	±60 s/month at 25 °C
• of which inputs usable for technological functions6; HSC (High Speed Counting)Source/sink inputYesNumber of simultaneously controllable inputsall mounting positions14— up to 40 °C, max.14Input voltage• Rated value (DC)24 V• for signal "0"5 V DC at 1 mA• for signal "1"15 V DC at 2.5 mAInput delay (for rated value of input voltage)for standard inputs0.2 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", max.0.2 msfor interrupt inputs12.8 ms	Digital inputs	
functionsYesSource/sink inputYesNumber of simultaneously controllable inputsall mounting positions— up to 40 °C, max.14Input voltage• Rated value (DC)24 V• for signal "0"5 V DC at 1 mA• for signal "1"15 V DC at 2.5 mAInput delay (for rated value of input voltage)for standard inputs— parameterizable0.2 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		14; Integrated
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)       5 V DC at 2.5 mA         for standard inputs       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       12.8 ms		6; HSC (High Speed Counting)
all mounting positions— up to 40 °C, max.14Input voltage24 V• Rated value (DC)24 V• for signal "0"5 V DC at 1 mA• for signal "1"15 V DC at 2.5 mAInput delay (for rated value of input voltage)for standard inputs0.2 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 msfor interrupt inputs12.8 ms	Source/sink input	Yes
	Number of simultaneously controllable inputs	
Input voltage • Rated value (DC) • for signal "0" • for signal "0" • for signal "1" 24 V 5 V DC at 1 mA 15 V DC at 2.5 mA Input delay (for rated value of input voltage) for standard inputs - parameterizable - parameterizable - at "0" to "1", min. - at "0" to "1", max. for interrupt inputs - Compared to the standard input inpu	all mounting positions	
• Rated value (DC)24 V• for signal "0"5 V DC at 1 mA• for signal "1"15 V DC at 2.5 mAInput delay (for rated value of input voltage)15 V DC at 2.5 mAfor standard inputs0.2 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 msfor interrupt inputs12.8 ms	— up to 40 °C, max.	14
<ul> <li>for signal "0"</li> <li>for signal "1"</li> <li>for signal "1"</li> <li>for signal "1"</li> <li>for standard inputs</li> <li>parameterizable</li> <li>- parameterizable</li> <li>- at "0" to "1", min.</li> <li>- at "0" to "1", max.</li> <li>for interrupt inputs</li> </ul>	Input voltage	
<ul> <li>for signal "1"</li> <li>15 V DC at 2.5 mA</li> <li>Input delay (for rated value of input voltage)</li> <li>for standard inputs</li> <li>— parameterizable</li> <li>— at "0" to "1", min.</li> <li>— at "0" to "1", max.</li> <li>for interrupt inputs</li> </ul>	<ul> <li>Rated value (DC)</li> </ul>	24 V
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       12.8 ms	● for signal "0"	5 V DC at 1 mA
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       12.8 ms	● for signal "1"	15 V DC at 2.5 mA
— parameterizable0.2 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 msfor interrupt inputs	Input delay (for rated value of input voltage)	
selectable in groups of four - at "0" to "1", min. - at "0" to "1", max. for interrupt inputs	for standard inputs	
<ul> <li>— at "0" to "1", max.</li> <li>for interrupt inputs</li> </ul>	— parameterizable	
for interrupt inputs	— at "0" to "1", min.	0.2 ms
	— at "0" to "1", max.	12.8 ms
— parameterizable Yes	for interrupt inputs	
	— parameterizable	Yes
for technological functions	for technological functions	
<ul> <li>parameterizable</li> <li>Single phase: 3 @ 100 kHz &amp; 3 @ 30 kHz, differential: 3 @ 80 kHz &amp; 3 @ 30 kHz</li> </ul>	— parameterizable	
Cable length	Cable length	
• shielded, max. 500 m; 50 m for technological functions	• shielded, max.	500 m; 50 m for technological functions
• unshielded, max. 300 m; for technological functions: No	• unshielded, max.	300 m; for technological functions: No
Digital outputs	Digital outputs	
Number of digital outputs     10; Relays	Number of digital outputs	10; Relays
Switching capacity of the outputs	Switching capacity of the outputs	
• with resistive load, max. 2 A	<ul> <li>with resistive load, max.</li> </ul>	2 A
• on lamp load, max. 30 W with DC, 200 W with AC	• on lamp load, max.	30 W with DC, 200 W with AC
Output delay with resistive load	Output delay with resistive load	

Number of analog inputs       2         Input ranges       Yes         • Voltage       Yes         Input ranges (rated values), voltages       Yes         • 0 to +10 V       Yes         — Input resistance (0 to 10 V)       ≥100k ohms         Cable length       100 m; twisted and shielded		
Relay outputs     10       • Number of relay outputs     10       • Number of operating cycles, max.     mechanically 10 million, at rated load voltage 100 000       Cable length     500 m       • unshielded, max.     500 m       • unshielded, max.     150 m       Analog inputs     2       Input ranges (rated values), voltages     2       • Voltage     Yes       Input ranges (rated values), voltages     2       • 10 to +10 V     Yes       — Input resistance (0 to 10 V)     2100k ohms       Cable length     100 m; twisted and shielded       Analog outputs     0       Analog outputs     0       Resolution with overrange (bit including sign), max.     10 bit       • Integration time/resolution ger channel     10 bit       • Resolution with overrange (bit including sign), max.     10 bit       • Integration time, parameterizable     625 µs       • Conversion time/resolution ger channel     265 µs       Encoder     2       Interface     PROFINET       Physics     Ethernet       Isolated     Yes       automatic detection of transmission rate     Yes       Autorcossing     Yes       Autorcossing     Yes       Interface byes     Yes       • Number of	• "0" to "1", max.	10 ms; max.
• Number of relay outputs10• Number of operating cycles, max.mechanically 10 million, at rated load voltage 100 000Cable length• shieled, max.500 m• unshieled, max.150 m• unshieled, max.150 mAnalog inputs2Input ranges• Voltage (rated values), voltagesVes• Number of analog inputs, voltagesYes• O to +10 VYes- Input resistance (0 to 10 V)2100k ohmsCable length• shielded, max.100 m; twisted and shieldedAnalog outputs0Cable length0• Shielded, max.100 m; twisted and shieldedAnalog outputs0Cable length0• Shielded, max.10 bit• Shielded, max.10 bit• Integration and conversion time/resolution per channel625 µs• Conversion time (per channel)625 µs• Conversion time (per channel)625 µs• Conversion time (per channel)PROFINET• Integration der sinsion rateYes• LinterfaceYesInterface typePROFINETPhysicsEthernetIsolatidYesautomatic detection of transmission rateYes• Number of ports1• Number of ports1• Number of ports1• Number of ports1• Integrated switchNo• Integrated switchNo	• "1" to "0", max.	10 ms; max.
Number of operating cycles, max.         mechanically 10 million, at rated load voltage 100 000           Cable length         500 m           • shielded, max.         500 m           • unshielded, max.         150 m           Analog inputs         2           Number of analog inputs         2           Input ranges (rated values), voltages         2           • Voltage         Yes           • Input renges (rated values), voltages         2           • Input resistance (0 to 10 V)         Yes           Cable length         3           • shielded, max.         100 m; twisted and shielded           Analog outputs         0           Analog outputs         0           Analog outputs         0           Number of analog outputs         0           Analog outputs         10 bit           mex.         10 bit           e.solution with overrange (bit including sign), max.         10 bit           e.Conversion time (per channel)         Yes           Encoder         Yes           Connectable encoders         Yes           e.Varies ensor         Yes           Interface type         PROFINET           Physics         Elthernet <thauto< td=""><td>Relay outputs</td><td></td></thauto<>	Relay outputs	
Cable length         500 m           • shielded, max.         500 m           • unshielded, max.         160 m           Analog inputs         Input resperiment           Number of analog inputs         2           Input ranges (rated values), voltages         Ves           • 0 to +10 V         Yes           - Input resistance (0 to 10 V)         Yes           Cable length         -           • shielded, max.         100 m; twisted and shielded           Analog outputs         0           Number of analog outputs         0           Analog outputs         0           Number of analog outputs         0           Analog outputs         0           Integration and conversion time/resolution per channel         -           • Resolution with overrange (bit including sign), max.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 µs           Encoder         -           Connectable encoders         Yes           • Zwier sensor         Yes           Interface         -           Interface type         PROFINET           Physics         Ethermet           Isolated<	<ul> <li>Number of relay outputs</li> </ul>	10
• shelded, max.500 m• unshielded, max.150 mAnalog inputs2Input rangesYes• VoltageYes• Voltage (rated values), voltagesYes• 0 to +10 VYes— Input resistance (0 to 10 V)>100k ohmsCable length2• shielded, max.100 m; twisted and shieldedAnalog outputs0Number of analog outputs0Integration and conversion time/resolution per channel10 bit• Resolution with overrange (bit including sign), max.10 bit• Integration and conversion time/resolution per channel25 jis• Conversion time (per channel)25 jis• Zonversion time (per channel)10 bit• LiterafaceYes• Analog value generation for the inputs10 bit• Integration sitime/resolution per channel25 jis• Conversion time (per channel)25 jis• Conversion time (per channel)25 jis• LiterafaceYes• LiterafaceYes• AutoregotiationYesautomatic detection of transmission rateYesAutonegotiationYesAutonegotiationYesAutonegotiationYesAutoresoring1• Number of ports1• Interface typeProvide• Number of ports1• Number of ports1• Number of ports1• Interface types1• Number of ports1• Number of ports1<	<ul> <li>Number of operating cycles, max.</li> </ul>	mechanically 10 million, at rated load voltage 100 000
• unshielded, max.         150 m           Analog inputs         2           Number of analog inputs         2           Input ranges         Yes           • Voltage         Yes           • 0 to +10 V         Yes           - Input resistance (0 to 10 V)         2100k ohms           Cable length         2           • shielded, max.         100 m; twisted and shielded           Analog outputs         0           Analog outputs         0           Analog value generation for the inputs         100 m; twisted and shielded           Analog value generation for the inputs         0           Max.         0         0           • Resolution with overange (bit including sign), max.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 µs           Encoder         Yes           Interface type         PROFINET           Physics         Ethernet           Isolad         Yes           automatic detection of transmission rat	Cable length	
Analog inputs         Z           Number of analog inputs         Z           Input ranges         Yes           • Voitage         Yes           Input ranges (rated values), voitages         >           • 0 to +10 V         Yes           - Input resistance (0 to 10 V)         >           > to b +10 V         >           - Input resistance (0 to 10 V)         >           > shielded, max.         100 m; twisted and shielded           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.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 µs           Encoder         Yes           Connectable encoders         Yes           • 2-wire sensor         Yes           Interface type         PROFINET           Physics         Ethernet           Isolated         Yes           Autoregotiation         Yes           Autoregotiation         Yes           Autoregotiation         Yes           Au	<ul> <li>shielded, max.</li> </ul>	500 m
Number of analog inputs         2           Input ranges         Ves           Input ranges (rated values), voltages         Ves           • 0 to +10 V         Yes           - Input resistance (0 to 10 V)         ≥100k ohms           Cable length         • shielded, max.           • shielded, max.         100 m; twisted and shielded           Analog outputs         0           Number of analog outputs         0           Analog value generation for the inputs         0           Analog value generation for the inputs         10 bit           • Resolution with overrange (bit including sign), max.         10 bit           • Integration time (per channet)         625 µs           Encoder         Yes           Connectable encoders         Yes           • 2-wire sensor         Yes           Interface type         PROFINET           Interface type         Yes           automatic detection of transmission rate         Yes           automatic detection of transmission rate         Yes           Autoregotiation         Yes           Autoregotiation         Yes           Number of ports         1           • integrated switch         No	• unshielded, max.	150 m
Input ranges         Yes           Input ranges (rated values), voltages         Yes           0 to +10 V         Yes           - Input resistance (0 to 10 V)         Yes           Cable length         0           - Input resistance (0 to 10 V)         100 m; twisted and shielded           Analog outputs         0           Analog outputs         0           Analog outputs         0           Analog outputs         0           Integration and conversion time/resolution per channel         Integration and conversion time/resolution per channel           • Resolution with overrange (bit including sign), max.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 µs           Encoder         Yes           • Conversion time (per channel)         625 µs           Encoder         Yes           • Linerface         Yes           • Linerface         Yes           Interface type         PROFINET           Physics         Ethernet           Isolated         Yes           automatic detection of transmission rate         Yes           Autocrossing         Yes           Autocrossing         1	Analog inputs	
• Voltage         Yes           Input ranges (rated values), voltages         Yes           • 0 to +10 V         >100k ohms           Cable length         >100 m; twisted and shielded           • shielded, max.         100 m; twisted and shielded           Analog outputs         0           Analog outputs         0           Analog outputs         0           Analog value generation for the inputs         0           Analog value generation for the inputs         0           Analog value generation for the inputs         0           max.         0           • Resolution with overrange (bit including sign), max.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 μs           Encoder         2           • Connectable encoders         1           • 2-wire sensor         Yes           Interface type         PROFINET           Physics         Ethernet           Isolated         Yes           automatic detection of transmission rate         Yes           Autoecossing         Yes           Interface types	Number of analog inputs	2
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         0           Analog outputs         0           Analog value generation for the inputs         0           Integration and conversion time/resolution per channel         •           • Resolution with overrange (bit including sign), max.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 μs           Connectable encoders         •           • 2-wire sensor         Yes           Interface type         PROFINET           Physics         Ethernet           Isolated         Yes           automatic detection of transmission rate         Yes           Autocrossing         Yes           Autocrossing         Yes           Interface types         Yes           • Number of ports         1           • Number of ports         1           • integrated switch         No	Input ranges	
• 0 to +10 V       Yes         Input resistance (0 to 10 V)       ≥100k ohms         Cable length       100 m; twisted and shielded         • shielded, max.       100 m; twisted and shielded         Analog outputs       0         Number of analog outputs       0         Analog value generation for the inputs       10 bit         Integration and conversion time/resolution per channel       •         • Resolution with overrange (bit including sign), max.       10 bit         • Integration time, parameterizable       Yes         • Conversion time (per channel)       625 μs         Encoder       2-wire sensor         Ves       10 bit         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autoregotiation       Yes         Autoregotiation       Yes         Interface types       Yes         Number of ports       1         • Number of ports       1         • integrated switch       No	Voltage	Yes
→ Input resistance (0 to 10 V)         ≥100k ohms           Cable length         100 m; twisted and shielded           • shielded, max.         100 m; twisted and shielded           Analog outputs         0           Analog value generation for the inputs         0           Integration and conversion time/resolution per channel         •           • Resolution with overrange (bit including sign), max.         10 bit           • Integration time, parameterizable         Yes           • Conversion time (per channel)         625 μs           Encoder         •           Connectable encoders         Yes           • 2-wire sensor         Yes           Interface type         PROFINET           Physics         Ethernet           Isolated         Yes           Autonegotiation         Yes           Autoresosing         Yes           • Number of ports         1           • Number of ports         1           • Interface types         Yes           • Number of ports         1           • Interface types         Yes           • Interface types         Yes           • Interface types         Yes           • Interface types         Yes	Input ranges (rated values), voltages	
Cable length       100 m; twisted and shielded         Analog outputs       0         Analog outputs       0         Analog value generation for the inputs       0         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       Ves         Connectable encoders       Yes         • 2-wire sensor       Yes         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autoregotiation       Yes         Autoregotiation       Yes         Number of ports       1         • integrate switch       No	• 0 to +10 V	Yes
• shielded, max.     100 m; twisted and shielded       Analog outputs     0       Analog value generation for the inputs     0       Integration and conversion time/resolution per channel     10 bit       • Resolution with overrange (bit including sign), max.     10 bit       • Integration time, parameterizable     Yes       • Conversion time (per channel)     625 µs       Encoder     Encoders       • 2-wire sensor     Yes       • 1nterface type     PROFINET       Physics     Ethernet       Isolated     Yes       automatic detection of transmission rate     Yes       Autocrossing     Yes       Interface types     Yes       • Number of ports     1       • Number of ports     1       • integrated switch     No	— Input resistance (0 to 10 V)	≥100k ohms
Analog outputs       0         Analog value generation for the inputs       0         Integration and conversion time/resolution per channel       0         • Resolution with overrange (bit including sign), max.       10 bit         • Integration time, parameterizable       Yes         • Conversion time (per channel)       625 µs         Encoder       Ves         • 2-wire sensor       Yes         • 1 Interface       Yes         Interface type       PROFINET         Physics       Ethermet         Isolated       Yes         automatic detection of transmission rate       Yes         Autocrossing       Yes         Autocrossing       Yes         Number of ports       1         • Number of ports       1         • integrated switch       No	Cable length	
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.     10 bit       • Integration time, parameterizable     Yes       • Conversion time (per channel)     625 µs       Encoder     625 µs       Connectable encoders     Yes       • 2-wire sensor     Yes       Interface     Yes       Interface type     PROFINET       Physics     Ethernet       Isolated     Yes       automatic detection of transmission rate     Yes       Autocrossing     Yes       Interface types     Yes       • Number of ports     1       • Number of ports     1       • integrated switch     No	<ul> <li>shielded, max.</li> </ul>	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.       10 bit         • Integration time, parameterizable       Yes         • Conversion time (per channel)       625 µs         Encoder       Connectable encoders         • 2-wire sensor       Yes         • 1nterface       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autocrossing       Yes         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         Autocrossing       Yes         Interface types       Yes         • Number of ports       1         • integrated switch       No	Analog outputs	
Integration and conversion time/resolution per channel         • Resolution with overrange (bit including sign), max.       10 bit         • Integration time, parameterizable       Yes         • Conversion time (per channel)       625 µs         Encoder       625 µs         • 2-wire sensor       Yes         • 2-wire sensor       Yes         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autorossing       Yes         Interface types       Yes         ethernet       Yes         Isolated       Yes         Autorossing       Yes         Number of ports       1         • Number of ports       1         • integrated switch       No	Number of analog outputs	0
• Resolution with overrange (bit including sign), max.       10 bit         • Integration time, parameterizable       Yes         • Conversion time (per channel)       625 μs         Encoder       Encoders         • 2-wire sensor       Yes         1 Interface       Yes         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autoregotiation       Yes         Autoregotiation       Yes         Interface types       Yes         • Number of ports       1         • Number of ports       1         • Number of ports       No         • integrated switch       No		
max.       Yes         • Integration time, parameterizable       Yes         • Conversion time (per channel)       625 µs         Encoder       Encoders         • 2-wire sensor       Yes         • 1. Interface       Yes         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autoregotiation       Yes         Autoregotiation       Yes         Interface types       Yes         • Number of ports       1         • Number of ports       No         • integrated switch       No		
• Integration time, parameterizable       Yes         • Conversion time (per channel)       625 µs         Encoder       Encoders         • 2-wire sensor       Yes         1 Interface       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autoregotiation       Yes         Autoregotiation       Yes         Interface types       Yes         • Number of ports       1         • Number of ports       1         • integrated switch       No		10 bit
• Conversion time (per channel)       625 μs         Encoder          Connectable encoders       Yes         • 2-wire sensor       Yes         Interface       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autorossing       Yes         Interface types       Yes         • Number of ports       1         • integrated switch       No		N
Encoder Connectable encoders  • 2-wire sensor Interface Interface Interface type PROFINET Physics Ethernet Isolated Yes automatic detection of transmission rate Autonegotiation Yes Autonegotiation Yes Interface types • Number of ports • integrated switch Protocols		
Connectable encoders       Yes         • 2-wire sensor       Yes         1. Interface       PROFINET         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       1         • Number of ports       1         • integrated switch       No	<ul> <li>Conversion time (per channel)</li> </ul>	625 µs
• 2-wire sensor       Yes         1. Interface       PROFINET         Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes         • Number of ports       1         • integrated switch       No         Protocols       Yes	Encoder	
Interface       Interface type     PROFINET       Physics     Ethernet       Isolated     Yes       automatic detection of transmission rate     Yes       Autonegotiation     Yes       Autocrossing     Yes       Interface types     Yes       • Number of ports     1       • integrated switch     No	Connectable encoders	
Interface type       PROFINET         Physics       Ethernet         Isolated       Yes         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes         • Number of ports       1         • integrated switch       No	• 2-wire sensor	Yes
Physics     Ethernet       Isolated     Yes       automatic detection of transmission rate     Yes       Autonegotiation     Yes       Autocrossing     Yes       Interface types     Yes       • Number of ports     1       • integrated switch     No	1. Interface	
IsolatedYesautomatic detection of transmission rateYesAutonegotiationYesAutocrossingYesInterface typesYes• Number of ports1• integrated switchNoProtocolsInterface types		PROFINET
automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes         • Number of ports       1         • integrated switch       No         Protocols       Yes	Physics	Ethernet
Autonegotiation     Yes       Autocrossing     Yes       Interface types     Yes       • Number of ports     1       • integrated switch     No       Protocols     Yes	Isolated	Yes
Autocrossing     Yes       Interface types     1       • Number of ports     1       • integrated switch     No       Protocols	automatic detection of transmission rate	Yes
Interface types       • Number of ports       • integrated switch       Protocols	Autonegotiation	Yes
• Number of ports     1       • integrated switch     No       Protocols	Autocrossing	Yes
integrated switch     No Protocols	Interface types	
Protocols	Number of ports	1
	<ul> <li>integrated switch</li> </ul>	No
PROFINET IO Controller     Yes	Protocols	
	PROFINET IO Controller	Yes

PROFINET IO Device	Yes
<ul> <li>SIMATIC communication</li> </ul>	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	No
PROFINET IO Controller	
<ul> <li>Transmission rate, max.</li> </ul>	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	No
— Prioritized startup	Yes
<ul> <li>— Number of IO devices with prioritized</li> </ul>	16
startup, max.	
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	16
- Number of connectable IO Devices for RT,	16
max.	
— of which in line, max.	16
<ul> <li>Activation/deactivation of IO Devices</li> </ul>	Yes
<ul> <li>— Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8
— 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
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared	2
device, max.	
Protocols	
Supports protocol for PROFINET IO	Yes

PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Open IE communication	
• TCP/IP	Yes
— Data length, max.	8 kbyte
<ul> <li>ISO-on-TCP (RFC1006)</li> </ul>	Yes
— Data length, max.	8 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
Web server	
supported	Yes
<ul> <li>User-defined websites</li> </ul>	Yes
OPC UA	
Runtime license required	Yes; "Basic" license required
OPC UA Server	Yes; Data access (read, write, subscribe), runtime license
	required
<ul> <li>Application authentication</li> </ul>	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of sessions, max.	5
<ul> <li>— Number of accessible variables, max.</li> </ul>	1 000
<ul> <li>— Number of subscriptions per session, max.</li> </ul>	5
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
— Number of monitored items, max.	500
— Number of server interfaces, max.	2
<ul> <li>— Number of nodes for user-defined server interfaces, max.</li> </ul>	1 000
Further protocols	
MODBUS	Yes
Communication functions	
S7 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

8 connections for open user communication (active or passive): TSEND\_C, TRCV\_C, TCON, TDISCON, TSEND and TRCV, 8 CPU/CPU connections (Client or Server) for GET/PUT data, 6 connections for dynamic assignment to GET/PUT or open user communication

Test commissioning functions	
Status/control	
<ul> <li>Status/control variable</li> </ul>	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers,
	counters
Forcing	
Forcing	Yes
Diagnostic buffer	
• present	Yes
Traces	
<ul> <li>Number of configurable Traces</li> </ul>	2
<ul> <li>Memory size per trace, max.</li> </ul>	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
Integrated Functions	
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 positioning axes via pulse-direction	Up to 4 with SB 1222
interface	
PID controller	Yes
Number of alarm inputs	4
Potential separation	
Potential separation digital inputs	
<ul> <li>Potential separation digital inputs</li> </ul>	500V AC for 1 minute
• between the channels, in groups of	1
Potential separation digital outputs	
<ul> <li>Potential separation digital outputs</li> </ul>	Relays
<ul> <li>between the channels</li> </ul>	No

EMC	
Interference immunity against discharge of static electri	city
<ul> <li>Interference immunity against discharge of static electricity acc. to IEC 61000-4-2</li> </ul>	Yes
— 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
<ul> <li>Interference immunity on signal cables acc. to IEC 61000-4-4</li> </ul>	Yes
Interference immunity against voltage surge	
<ul> <li>Interference immunity on supply lines acc. to IEC 61000-4-5</li> </ul>	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	
<ul> <li>Limit class A, for use in industrial areas</li> </ul>	Yes; Group 1
<ul> <li>Limit class B, for use in residential areas</li> </ul>	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
	IP20
IP degree of protection	IP20 Yes
IP degree of protection Standards, approvals, certificates	
IP degree of protection Standards, approvals, certificates CE mark	Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval	Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK)	Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval	Yes Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK)	Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval	Yes Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval Marine approval	Yes Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval Marine approval Ambient conditions	Yes Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval Marine approval Ambient conditions Free fall	Yes Yes Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval Marine approval Marine approval Free fall • Fall height, max.	Yes Yes Yes Yes Yes Yes
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval Marine approval Ambient conditions Free fall • Fall height, max. Ambient temperature during operation	Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package
IP degree of protection          Standards, approvals, certificates         CE mark         UL approval         cULus         FM approval         RCM (formerly C-TICK)         KC approval         Marine approval         Ambient conditions         Free fall         • Fall height, max.         Ambient temperature during operation         • min.	Yes Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package -20 °C 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
IP degree of protection          Standards, approvals, certificates         CE mark         UL approval         cULus         FM approval         RCM (formerly C-TICK)         KC approval         Marine approval         Ambient conditions         Free fall         • Fall height, max.         Ambient temperature during operation         • min.         • max.	Yes Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package -20 °C 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
IP degree of protection Standards, approvals, certificates CE mark UL approval cULus FM approval RCM (formerly C-TICK) KC approval Marine approval Ambient conditions Free fall • Fall height, max. Ambient temperature during operation • min. • max. • horizontal installation, min.	Yes Yes Yes Yes Yes Yes Yes Yes O.3 m; five times, in product package -20 °C 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 -20 °C

<ul> <li>vertical installation, max.</li> </ul>	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
<ul> <li>Storage/transport, min.</li> </ul>	660 hPa
Storage/transport, max.	1 080 hPa
Altitude during operation relating to sea level	
Installation altitude, min.	-1 000 m
<ul> <li>Installation altitude, max.</li> </ul>	2 000 m
Relative humidity	
• Operation, max.	95 %; no condensation
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
Pollutant concentrations	
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	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
<ul> <li>Copy protection</li> </ul>	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.	435 g
last modified:	07/10/2020