



SIPLUS SM 1223 digital input/output modules

Overview

- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

Application

Digital input/output modules permit:

- Connection of the controller to digital signals of the process
- Output of digital signals from the controller to the process

This provides users with the following advantages:

- Optimum adaptation:
With signal modules which can be mixed as desired, users can adapt their controllers exactly to the relevant task. This avoids superfluous investments. Modules with 8, 16, and 32 input/output channels are available.
- Flexibility:
If the task is expanded subsequently, the controller can be upgraded. Updating of the user program is extremely simple

Function

The SM 1223 digital input/output signal modules convert:

- the level of the external digital signals from the process into the internal signal level of the S7-1200 controller and
- the internal signal level of the SIMATIC S7-1200 Controller into the external signal level required for the process.

Technical specifications

Article number	6AG1223-1BH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1BH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1PH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6AG1223-1PH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
General information				
Product type designation	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 8x24 V DC, DQ 8x relay	SM 1223, DI 8x24 V DC, DQ 8x relay
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V
Input current				
from backplane bus 5 V DC, max.	145 mA	145 mA	145 mA	145 mA
Digital inputs				
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/relay	4 mA/input 11 mA/relay
output voltage / header supply voltage of the transmitters / header				
• product function / supply voltage for transmitters	Yes	Yes	Yes	Yes
Power loss				
Power loss, typ.	2.5 W	2.5 W	5.5 W	5.5 W
Digital inputs				
Number of digital inputs	8	8	8	8
• in groups of	2	2	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs				
all mounting positions				
— up to 40 °C, max.	8	8	8	8
horizontal installation				
— up to 40 °C, max.	8	8	8	8
— up to 50 °C, max.	8	8	8	8
vertical installation				
— up to 40 °C, max.	8	8	8	8
Input voltage				
• Type of input voltage	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA

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Input current				
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage)				
for standard inputs				
— parameterizable	Yes; 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	Yes; 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	Yes; 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	Yes; 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
for interrupt inputs				
— parameterizable	Yes	Yes	Yes	Yes
Cable length				
• shielded, max.	500 m	500 m	500 m	500 m
• unshielded, max.	300 m	300 m	300 m	300 m
Digital outputs				
Number of digital outputs	8	8	8	8
• in groups of	1	1	2	2
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)		
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage				
• Rated value (DC)	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)			5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load		
• for signal "1", min.	20 V DC	20 V DC		
Output current				
• for signal "1" rated value	0.5 A	0.5 A	2 A	2 A
• for signal "1" permissible range, max.	0.5 A	0.5 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA		
Output delay with resistive load				
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms
Total current of the outputs (per group)				
horizontal installation				
— up to 50 °C, max.	4 A; Current per mass	4 A; Current per mass	10 A; Current per mass	10 A; Current per mass
Relay outputs				
• Number of relay outputs			8	8
• Rated supply voltage of relay coil L+ (DC)			24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
Switching capacity of contacts				
— with inductive load, max.			2 A	2 A
— on lamp load, max.			30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
— with resistive load, max.			2 A	2 A
Cable length				
• shielded, max.	500 m	500 m	500 m	500 m
• unshielded, max.	150 m	150 m	150 m	150 m
Interrupts/diagnostics/status information				
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• for status of the inputs	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes
Potential separation				

Article number	6AG1223-1BH32-2XB0	6AG1223-1BH32-4XB0	6AG1223-1PH32-2XB0	6AG1223-1PH32-4XB0
	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Potential separation digital inputs				
• between the channels, in groups of	2	2	2	2
Potential separation digital outputs				
• between the channels			Relays	Relays
• between the channels, in groups of	1	1	2	2
• between the channels and backplane bus	500 V AC	500 V AC	1 500 V AC for 1 minute	1 500 V AC for 1 minute
Permissible potential difference between different circuits			750 V AC for 1 minute	750 V AC for 1 minute
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
— Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes
Use in stationary industrial systems				
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea				
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology				

Article number	6AG1223-1BH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1BH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ	6AG1223-1PH32-2XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	6AG1223-1PH32-4XB0 SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	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)	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)	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)	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				
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
connection method / header				
required front connector	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• Plastic	Yes	Yes	Yes	Yes
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	210 g	210 g	230 g	230 g
Article number	6AG1223-1PL32-2XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6AG1223-1PL32-4XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6AG1223-1BL32-2XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ	6AG1223-1BL32-4XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ
General information				
Product type designation	SM 1223, DI 16x24 V DC, DQ 16x relay	SM 1223, DI 16x24 V DC, DQ 16x relay	SM 1223, DI 16x24 V DC, DQ 16x24 V DC	SM 1223, DI 16x24 V DC, DQ 16x24 V DC
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
permissible range, lower limit (DC)	20.4 V	20.4 V	20.4 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V
Input current				
from backplane bus 5 V DC, max.	180 mA	180 mA	185 mA	185 mA
Digital inputs				
• from load voltage L+ (without load), max.	4 mA/input 11 mA/relay	4 mA/input 11 mA/relay	4 mA; per channel	4 mA; per channel
output voltage / header				
supply voltage of the transmitters / header				
• product function / supply voltage for transmitters	Yes	Yes	Yes	Yes
Power loss				
Power loss, typ.	10 W	10 W	4.5 W	4.5 W
Digital inputs				
Number of digital inputs	16	16	16	16
• in groups of	2	2	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs				
all mounting positions				
— up to 40 °C, max.	16	16	16	16
horizontal installation				
— up to 40 °C, max.	16	16	16	16
— up to 50 °C, max.	16	16	16	16
vertical installation				

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— up to 40 °C, max.	16	16	16	16
Input voltage				
• Type of input voltage	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current				
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA
Input delay (for rated value of input voltage)				
for standard inputs				
— parameterizable	Yes; 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	Yes; 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	Yes; 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	Yes; 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
for interrupt inputs				
— parameterizable	Yes	Yes	Yes	Yes
Cable length				
• shielded, max.	500 m	500 m	500 m	500 m
• unshielded, max.	300 m	300 m	300 m	300 m
Digital outputs				
Number of digital outputs	16	16	16	16
• in groups of	4	4	1	1
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally L+ (-48 V)	No; to be provided externally L+ (-48 V)
Limitation of inductive shutdown voltage to				
Switching capacity of the outputs				
• with resistive load, max.	2 A	2 A	0.5 A	0.5 A
• on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	5 W	5 W
Output voltage				
• Rated value (DC)	5 V DC to 30 V DC	5 V DC to 30 V DC	24 V	24 V
• Rated value (AC)	5 V AC to 250 V AC	5 V AC to 250 V AC		
• for signal "0", max.			0.1 V; with 10 kOhm load 20 V DC	0.1 V; with 10 kOhm load 20 V DC
• for signal "1", min.				
Output current				
• for signal "1" rated value	2 A	2 A	0.5 A	0.5 A
• for signal "1" permissible range, max.	2 A	2 A	0.5 A	0.5 A
• for signal "0" residual current, max.			10 µA	10 µA
Output delay with resistive load				
• "0" to "1", max.	10 ms	10 ms	50 µs	50 µs
• "1" to "0", max.	10 ms	10 ms	200 µs	200 µs
Total current of the outputs (per group)				
horizontal installation				
— up to 50 °C, max.	8 A; Current per mass	8 A; Current per mass	8 A; Current per mass	8 A; Current per mass
Relay outputs				
• Number of relay outputs	16	16		
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V		
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000		
Switching capacity of contacts				
— with inductive load, max.	2 A	2 A	0.5 A	0.5 A
— on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	5 W	5 W
— with resistive load, max.	2 A	2 A	0.5 A	0.5 A
Cable length				
• shielded, max.	500 m	500 m	500 m	500 m
• unshielded, max.	150 m	150 m	150 m	150 m
Interrupts/diagnostics/status information				
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnoses				

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	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ	SIPLUS S7-1200 SM 1223 16DI/16DQ
• Monitoring the supply voltage	Yes	Yes		
Diagnostics indication LED				
• for status of the inputs	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes
Potential separation				
Potential separation digital inputs				
• between the channels, in groups of	2	2	2	2
Potential separation digital outputs				
• between the channels	Relays	Relays		
• between the channels, in groups of	4	4	1	1
• between the channels and backplane bus	1 500 V AC for 1 minute	1 500 V AC for 1 minute	500 V AC	500 V AC
Permissible potential difference between different circuits	750 V AC for 1 minute	750 V AC for 1 minute		
Degree and class of protection				
IP degree of protection	IP20	IP20	IP20	IP20
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
— Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes
Use in stationary industrial systems				
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request

Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ	SIPLUS S7-1200 SM 1223 16DI/16DQ
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology				
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	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)	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)	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)	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				
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
connection method / header				
required front connector	Yes	Yes	Yes	Yes
Mechanics/material				
Enclosure material (front)				
• Plastic	Yes	Yes	Yes	Yes
Dimensions				
Width	70 mm	70 mm	70 mm	70 mm
Height	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm
Weights				
Weight, approx.	350 g	350 g	310 g	310 g
Article number				
	6AG1223-1QH32-2XB0		6AG1223-1QH32-4XB0	
	SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY		SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	
General information				
Product type designation	SM 1223, DI 8x120/230 V AC, DQ 8x relay		SM 1223, DI 8x120/230 V AC, DQ 8x relay	
Supply voltage				
Rated value (DC)	24 V		24 V	
permissible range, lower limit (DC)	20.4 V		20.4 V	
permissible range, upper limit (DC)	28.8 V		28.8 V	
Input current				
from backplane bus 5 V DC, max.	120 mA		120 mA	
output voltage / header				
supply voltage of the transmitters / header				
• product function / supply voltage for transmitters	Yes		Yes	
Power loss				
Power loss, typ.	7.5 W		7.5 W	
Digital inputs				
Number of digital inputs	8		8	
• in groups of	4		4	
Input characteristic curve in accordance with IEC 61131, type 1	Yes		Yes	
Number of simultaneously controllable inputs				
all mounting positions				
— up to 40 °C, max.	8		8	
horizontal installation				
— up to 40 °C, max.	8		8	
— up to 50 °C, max.	8		8	
vertical installation				

Article number	6AG1223-1QH32-2XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	6AG1223-1QH32-4XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
— up to 40 °C, max.	8	8
Input voltage		
• Type of input voltage	AC	AC
• Rated value (AC)	120/230 V AC	120/230 V AC
• for signal "0"	20 V AC at 1 mA	20 V AC at 1 mA
• for signal "1"	79 V AC at 2.5 mA	79 V AC at 2.5 mA
Input current		
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	9 mA	9 mA
Input delay (for rated value of input voltage) for standard inputs		
— parameterizable	Yes; 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	Yes; 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
for interrupt inputs		
— parameterizable	Yes	Yes
Cable length		
• shielded, max.	500 m	500 m
• unshielded, max.	300 m	300 m
Digital outputs		
Number of digital outputs	8	8
• in groups of	4	4
Short-circuit protection	No; to be provided externally	No; to be provided externally
Switching capacity of the outputs		
• with resistive load, max.	2 A	2 A
• on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage		
• Rated value (DC)	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC	5 V AC to 250 V AC
Output current		
• for signal "1" rated value	2 A	2 A
• for signal "1" permissible range, max.	2 A	2 A
Output delay with resistive load		
• "0" to "1", max.	10 ms	10 ms
• "1" to "0", max.	10 ms	10 ms
Total current of the outputs (per group) horizontal installation		
— up to 50 °C, max.	8 A; Current per mass	8 A; Current per mass
Relay outputs		
• Number of relay outputs	8	8
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V
• Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
Switching capacity of contacts		
— with inductive load, max.	2 A	2 A
— on lamp load, max.	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
— with resistive load, max.	2 A	2 A
Cable length		
• shielded, max.	500 m	500 m
• unshielded, max.	150 m	150 m
Interrupts/diagnostics/status information		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
Potential separation		
Potential separation digital inputs		
• between the channels, in groups of	2	2
Potential separation digital outputs		
• between the channels	Relays	Relays
• between the channels, in groups of	2	2
• between the channels and backplane bus	1 500 V AC for 1 minute	1 500 V AC for 1 minute
Permissible potential difference between different circuits		
	750 V AC for 1 minute	750 V AC for 1 minute
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Ambient temperature during operation		

Article number	6AG1223-1QH32-2XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	6AG1223-1QH32-4XB0 SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• Operation at 25 °C without condensation, max.	95 %	95 %
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *	Yes; Class 3S4 incl. sand, dust; *
Use on ships/at sea		
— to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
— to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Usage in industrial process technology		
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	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)	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		
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high reliability	Yes; Class 2 for high reliability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
connection method / header		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	230 g	230 g