



## SIPLUS SB 1223 digital input/output modules

### Overview

- Digital inputs and outputs as supplement to the integral I/O of the SIPLUS S7-1200 CPUs
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

### 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

The SB 1223 digital input/output signal board permits:

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

### Design

The signal boards are plugged directly into the receptacle on the front of each S7-1200 CPU.

- Mounting:  
Signal boards are plugged directly into the SIMATIC S7-1200 CPU and are thus electrically and mechanically connected to the CPU
- The CPU mounting dimensions remain unchanged
- All signal boards are easy to replace thanks to removable connecting terminals ("independent wiring")

### Function

The SB 1223 digital input/output signal board converts

- 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	6AG1223-0BD30-4XB0	6AG1223-0BD30-5XB0	6AG1223-3AD30-5XB0	6AG1223-3BD30-5XB0
	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
<b>General information</b>				
Product type designation	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	SB 1223, DI 2x5 V DC/DQ 2x5 V DC 200 kHz	SB 1223, DI 2x24 V DC/DQ 2x24 V DC 200 kHz
<b>Engineering with</b>				
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275		see entry ID: 109746275	see entry ID: 109746275
<b>Supply voltage</b>				
permissible range, lower limit (DC)	20.4 V	20.4 V		
permissible range, upper limit (DC)	28.8 V	28.8 V		
<b>Input current</b>				
from backplane bus 5 V DC, typ.	50 mA		50 mA	50 mA
<b>output voltage / header</b>				
<b>supply voltage of the transmitters / header</b>				
• supply current / from supply voltage for transmitter / maximum	4 mA; per channel		4 mA; per channel	4 mA; per channel
<b>Power loss</b>				
Power loss, typ.	1 W	1 W	0.5 W	1 W
<b>Digital inputs</b>				
Number of digital inputs	2; Current-sinking	2	2	2
• in groups of	1		1	1
Input characteristic curve in accordance with IEC 61131, type 1	Yes		Yes	Yes
<b>Number of simultaneously controllable inputs</b>				
<b>all mounting positions</b>				
— up to 40 °C, max.	2		2	2
<b>Input voltage</b>				
• Type of input voltage	DC	DC	DC	DC
• Rated value (DC)	24 V		5 V	24 V
• for signal "0"	0 to 5 V		0 to 1 V	0 to 5 V
• for signal "1"	+15 to +30 V		2 to 6 V	+15 to +30 V
<b>Input current</b>				
• for signal "0", max. (permissible quiescent current)	1 mA		3 mA	2 mA

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• for signal "1", min.			6 mA	5.8 mA
• for signal "1", typ.	7 mA	7 mA		14 mA
<b>Input delay (for rated value of input voltage)</b>				
<b>for standard inputs</b>				
— 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
— at "0" to "1", max.	2 µs		2 µs	2.5 µs
— at "1" to "0", max.	10 µs			
<b>for interrupt inputs</b>				
— parameterizable	Yes		Yes	Yes
<b>for technological functions</b>				
— parameterizable	Yes		Yes	Yes
<b>Cable length</b>				
• shielded, max.	50 m	50 m	50 m	50 m; Standard input: 500 m, high-speed counters: 50 m
<b>Digital outputs</b>				
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2	2	2
• in groups of	1		1	1
Short-circuit protection	No	No	No	No
<b>Switching capacity of the outputs</b>				
• with resistive load, max.	0.5 A		0.1 A	0.1 A
• on lamp load, max.	5 W			
<b>Load resistance range</b>				
• upper limit	0.6 Ω		5 Ω	10 Ω
<b>Output voltage</b>				
• Rated value (DC)	24 V		5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load		0.4 V	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V		L+ (-0.5 V)	20 V
• for signal "1", max.			6 V	
<b>Output current</b>				
• for signal "1" permissible range, max.	0.5 A		0.1 A	0.1 A
• for signal "0" residual current, max.	10 µA			10 µA
<b>Cable length</b>				
• shielded, max.	50 m	50 m	50 m	500 m
• unshielded, max.				150 m
<b>Interrupts/diagnostics/status information</b>				
Alarms	Yes		Yes	Yes
Diagnostics function	Yes		Yes	Yes
<b>Diagnostics indication LED</b>				
• for status of the inputs	Yes		Yes	Yes
• for status of the outputs	Yes		Yes	Yes
<b>Ambient conditions</b>				
<b>Free fall</b>				
• Fall height, max.	0.3 m; five times, in product package			
<b>Ambient temperature during operation</b>				
• min.	-20 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
<b>Ambient temperature during storage/transportation</b>				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
<b>Altitude during operation relating to sea level</b>				
• Installation altitude above sea level, max.	5 000 m	5 000 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)	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)
<b>Relative humidity</b>				

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• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost permitted (no commissioning in bedewed state)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
<b>Resistance</b>				
<b>Coolants and lubricants</b>				
— 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	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>				
— 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; *
<b>Use on ships/at sea</b>				
— 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; *
<b>Usage in industrial process technology</b>				
— 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)
<b>Remark</b>				
— 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!
<b>Conformal coating</b>				
• 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
<b>Mechanics/material</b>				
Enclosure material (front)				
• Plastic	Yes		Yes	Yes
<b>Dimensions</b>				
Width	38 mm	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm	21 mm
<b>Weights</b>				
Weight, approx.	40 g		40 g	40 g