SIEMENS

Data sheet

6AG1138-6AA01-2BA0



SIPLUS ET 200SP TM count 1x24V based on 6ES7138-6AA01-0BA0 with conformal coating, -40...+60 $^{\circ}$ C, counter module, 1 channel for 24 V incremental or pulse generator, 3 DI, 2 DQ suitable for BU type A0,

Figure similar

Figure similar	
General information	
Product type designation	TM Count 1x24V
Firmware version	
FW update possible	Yes
usable BaseUnits	BU type A0
Color code for module-specific color identification plate	CC00
Product function	
• I&M data	Yes; I&M0 to I&M3
 Isochronous mode 	Yes
Supply voltage	
Load voltage L+	
 Rated value (DC) 	24 V
 permissible range, lower limit (DC) 	19.2 V
 permissible range, upper limit (DC) 	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption, max.	60 mA; without load
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
Short-circuit protection	Yes; electronic/thermal
 Output current, max. 	300 mA
Power loss	
Power loss, typ.	1 W
Address area	
Address space per module	
Inputs	16 byte; 4 bytes in Fast mode
Outputs	12 byte; 4 bytes for Motion Control, 0 bytes for Fast mode
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
Gate start/stop	Yes
Capture	Yes
 Synchronization 	Yes
 Freely usable digital input 	Yes
• Probe	Yes

Injust contings		
For signal "O" 5 ± 9 V	Input voltage	
		24 V
Permissible voltage at injust, min. 30 V; 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V 5 V continuous, 30 V brief reverse polarity protection 30 V continuous, 30 V brief reverse polarity protection 30 V continuous, 30 V brief reverse polarity protection 30 V continuous, 30	• for signal "0"	-5 +5 V
Input course For signal "1", typ. 2.5 mA	• for signal "1"	+11 to +30V
Input current	 permissible voltage at input, min. 	-30 V; -5 V continuous, -30 V brief reverse polarity protection
Figure 17 17 17 17 17 17 17 1	 permissible voltage at input, max. 	30 V
Input delay (for rated value of input votage) for standard inputs	Input current	
For standard inputs	• for signal "1", typ.	2.5 mA
For standard inputs	Input delay (for rated value of input voltage)	
— a to "or to "1", min. 6 μs, for parameterization "none" — a to "or to "1", min. 6 μs, for parameterization "none" — a to "or to "1", min. 6 μs, for parameterization "none" — parameterization Ves Cable length • Second Mark • shelded, max. 4000 m • shelded, max. 4000 m • Parameterization Ves Digital outputs Transistor Number of digital output Yes Short-circult protection Yes • Response threshold, typ. 1, A • Response threshold, typ. 1, A • Response threshold, typ. 1, A • Freely usable digital output Yes • Short-circult protection Yes (ectronic/themal • Response threshold, typ. 1, A • Response threshold, typ. 1, A • Controlling a digital input Yes • Short-circult protection Yes • Short-circult protection and threshold of the coupts Yes • Freely usable digital output Yes • Short pat threshold, max. 0, 5 A; Per digital output <td></td> <td></td>		
	·	Yes: none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
	•	6 us: for parameterization "none"
For exchnological functions		
A		ο μο, τοι parameterization ποπο
Selection Sele		Voc
• shielded, max. 600 m Digital outputs Type of digital output Transistor Number of digital outputs. 2 Digital outputs, parameterizable Yes Short-ricuit protection Yes, electronic/thermal • Response threshold, typ. 1 A Limitation of inductive shutdown voltage to L+ (≤3 V) Controlling a digital input Yes • Switching tripped by comparison values Yes • Freely usable digital output Yes • Switching apadie of the outputs Yes • Investigate of the outputs Yes • Or signal *1*min 48 Ω • Opper limit 48 Ω • Output uvertal Yes • Or signal *1*min mun load current 2 X Y L+ (-0.8 V) Output uvertal Yes • Or signal *1*minimum load current 2 mA • Or signal *1*minimum load current 2		165
• unshielded, max Pope of light output Transistor Number of digital output Yes Digital outputs Pyes Septemberizable Yes Short-circuit protection Yes Selectonicithermal • Response threshold, typ.	-	4.000
Type of digital output	,	
Type of digital output		000 m
Number of digital outputs Yes		
Digital outputs, parameterizable Yes Short-ricult protection Yes ; electronic/thermal		
Short-circuit protection Yes; electronic/thermal • Response threshold, typ. 1 A Limitation of inductive shutdown voltage to L+ (53 V) Controlling a digital input Yes Switching tipped by comparison values Yes • Switching capacity of the outputs Yes • with resistive load, max. 0.5 A; Per digital output • on lamp load, max. 5 W • lower limit 48 Ω • upper limit 12 kΩ Output voltage • for signal *1", min. 23.2 V; L+ (-0.8 V) Output voltage • for signal *1" brainsible range, max. 0.6 A; Per digital output • for signal *1" riminmum load current 2 mA 0.5 mA Output delay with resistive load 2 mA 0.5 mA Output delay with resistive load, max. 50 μs 9 • "1' to "0", max. 50 μs 9 Switching frequency 0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve 0 Hz • outh resistive load, max. 0 KHz 0 Hz • Current per module, max. 10 MB 100 m • shelded,	Number of digital outputs	2
Response threshold, typ. Limitation of inductive shutdown voltage to L+ (-53 V) Controlling a digital input Pyes Digital output functions, parameterizable Switching tripped by comparison values Freely usable digital output ves Switching capacity of the outputs • with resistive load, max. • on lamp load, max. • on lamp load, max. • lower limit • upper limit • upper limit • upper limit • or signal *1", min. • or signal *1" rated value • for signal *1" rated value • for signal *1" remissible range, max. • for signal *1" resistive load • "0" to "1", max. • So µs • "1" to "0", max. 50 µs • "1" to "0", max. 50 µs • "1" to "0", max. 50 µs • "1" to "0", max. • on lamp load, max. • with inductive load, max. • on lamp load, max. • with resistive load • "0" to "1", max. • So µs Switching frequency • with resistive load, max. • on lamp load, ma	Digital outputs, parameterizable	Yes
Limitation of inductive shutdown voltage to L+ (-53 V) Controlling a digital input Yes Switching tripped by comparison values Yes Freely usable digital output of the outputs with resistive load, max. on lamp load, max. on lamp load, max. Load resistance range lower limit upper limit lor signal "1", min. 23.2 V; L+ (-0.8 V) Cutput voltage of or signal "1" rated value of or signal "1" rated value of or signal "1" rated value of or signal "1" minimum load current of or signal "1" minimum load current of or signal "1" minimum load current of or signal "1" max. of or signal "0" residual current, max. Output delay with resistive load o"0" o"1", max. Sultching frequency with resistive load, max. o"1" to "0", max. Sultching frequency with inductive load, max. on lamp load, max. on lamp load, max. on lamp load, max. on lamp load, max. output leads, max. on lamp load, max. on lamp load, max. on lamp load coursent of the outputs Current per module, max. on lamp load, max. on lamp load, max. on lamp load coursent of the outputs of coursel per module, max. on lamp load coursent of the outputs of coursel per module, max. on lamp load, max. on lamp load, max. on lamp load coursent of the outputs of current per module, max. folion minimum load current of the outputs of curren	Short-circuit protection	Yes; electronic/thermal
Digital cutput functions, parameterizable	Response threshold, typ.	1 A
Digital output functions, parameterizable • Switching tripped by comparison values • Freely usable digital output • with resistive load, max. • on lamp load, max. • on lamp load, max. • lower limit • upper limit • upper limit • for signal "1", min. • for signal "1" rated value • for signal "1" rated value • for signal "1" min. • fo	Limitation of inductive shutdown voltage to	L+ (-53 V)
Switching tripped by comparison values Freely usable digital output • with resistive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • lower limit • upper limit • upper limit • upper limit • upper limit • output voltage • for signal "1", min. • of signal "1" rated value • for signal "1" minimum load current • for signal "0" residual current, max. • of signal "1" minimum load current • for signal "0" residual current, max. • of signal "0" residual current, max. • 50 μs • "1" to "0", max. • 50 μs Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • Cable length • shielded, max. • shielded, max. • shielded, max. • unshielded, max. • shielded, max. • chooter Connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. • In 5m A In 5m A	Controlling a digital input	Yes
Switching tripped by comparison values Freely usable digital output • with resistive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • lower limit • upper limit • upper limit • upper limit • upper limit • output voltage • for signal "1", min. • of signal "1" rated value • for signal "1" minimum load current • for signal "0" residual current, max. • of signal "1" minimum load current • for signal "0" residual current, max. • of signal "0" residual current, max. • 50 μs • "1" to "0", max. • 50 μs Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • Cable length • shielded, max. • shielded, max. • shielded, max. • unshielded, max. • shielded, max. • chooter Connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. • In 5m A In 5m A	Digital output functions, parameterizable	
• Freely usable digital output Switching capacity of the outputs • with resistive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • for signal "1", min. • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "1" riminimum load current • for signal "1" riminimum load current • for signal "1" minimum load current • for signal "0" residual current, max. • for signal "0" residual current, max. • 0.5 mA Cutput delay with resistive load • "0" to "1", max. • "1" to "0", max. Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • Shielded, max. • Shielded, max. • Shielded, max. • Unshielded, max. • U	-	Yes
with resistive load, max. 0.5 A; Per digital output		Yes
with resistive load, max. on lamp load, max. ≥ W Load resistance range lower limit		
		0.5 A: Per digital output
Load resistance range • lower limit • upper limit • upper limit • upper limit • for signal "1", min. 23.2 V; L+ (-0.8 V) Output current • for signal "1" rated value • for signal "1" rated value • for signal "1" minimum load current • for signal "1" minimum load current • for signal "0" residual current, max. • for signal "0" residual current, max. 0.5 mA Output delay with resistive load • "0" to "1", max. • "1" to "0", max. 50 μs Switching frequency • with resistive load, max. • unith inductive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • shielded, max. • shielded, max. • unshielded, max. • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • input voltage 24 V		
		J VV
• upper limit Output voltage • for signal "1", min. Output current • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. O.5 A; Per digital output • for signal "1" minimum load current • for signal "0" residual current, max. O.5 mA Output delay with resistive load • "0" to "1", max. • "1" to "0", max. • "1" to "0", max. • "1" to "0", max. • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Current per module, max. • Current per module, max. • Suiteled, max. • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • 1000 m • shielded, max. • 1000 m		40.0
Output voltage • for signal "1", min. 23.2 V; L+ (-0.8 V) Output current • for signal "1" rated value • for signal "1" premissible range, max. • for signal "1" minimum load current • for signal "1" minimum load current • for signal "0" residual current, max. 0.5 mA Output delay with resistive load • "0" to "1", max. • "1" to "0", max. 50 µs • "1" to "0", max. Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. 10 kHz • on lamp load, max. 10 kHz Cable length • Shielded, max. • condenctable encoders • 2-wire sensor • permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage		
• for signal "1", min. Output current • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "1" minimum load current • for signal "0" residual current, max. O.5 mA Output delay with resistive load • "0" to "1", max. • "1" to "0", max. Switching frequency • with resistive load, max. • with institive load, max. • on lamp load, max. • on lamp load, max. • Current per module, max. • Current per module, max. • Shielded, max. • unshielded, max. • 1000 m • connectable encoders • 2-wire sensor • 2-wire sensor • permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage		12 KΩ
Output current • for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. • for signal "0" residual current, max. • "0" to "1", max. • "0" to "1", max. • "1" to "0", max. Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Current per module, max. • Cable length • shielded, max. • unshielded, max. • loon mectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage	-	20.01/1. (2.01/)
• for signal "1" rated value • for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "1" minimum load current • for signal "0" residual current, max. 0.5 mA Output delay with resistive load • "0" to "1", max. • "1" to "0", max. 50 µs Switching frequency • with resistive load, max. • with resistive load, max. • on lamp load, max. • on lamp load, max. • Current per module, max. • Current per module, max. • shielded, max. • unshielded, max. • unshielded, max. • current of the outputs • Shielded, max. • current of the outputs • Shielded, max. • current of the outputs • Shielded, max. • 1000 m	·	23.2 V; L+ (-0.8 V)
• for signal "1" permissible range, max. • for signal "1" minimum load current • for signal "0" residual current, max. 0.5 mA Output delay with resistive load • "0" to "1", max. • "1" to "0", max. • "1" to "0", max. • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Current per module, max. • Current per module, max. • shielded, max. • shielded, max. • unshielded, max. • current of the outputs • Shielded, max. • I 1000 m • Shielded, max. • Connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage	·	
• for signal "1" minimum load current • for signal "0" residual current, max. Output delay with resistive load • "0" to "1", max. • "1" to "0", max. Switching frequency • with resistive load, max. • with inductive load, max. • with inductive load, max. • on lamp load, max. • O.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve • on lamp load, max. 10 Hz Total current of the outputs • Current per module, max. 1 A Cable length • shielded, max. • unshielded, max. • unshielded, max. • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 2 MA 0.5 mA 10 MHz 10 KHz	-	
• for signal "0" residual current, max. Output delay with resistive load • "0" to "1", max. • "1" to "0", max. Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Current of the outputs • Current per module, max. • shielded, max. • unshielded, max. • unshielded, max. • connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 50 μs 50 μs 50 μs 50 μs 50 μs 50 μs 10 kHz 10 kHz 10 kHz 10 kHz 10 Hz 10 Hz 10 Hz 10 M π 600 m 10 M π		0.6 A; Per digital output
Output delay with resistive load • "0" to "1", max. • "1" to "0", max. 50 µs Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Current per module, max. • Current per module, max. • shielded, max. • unshielded, max. • unshielded, max. • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 50 µs 50 µs 50 µs 50 µs 50 µs 50 µs 10 kHz 10 kHz 10 kHz 10 kHz 10 Hz 10	9	
 """ to "0", max. 50 μs Switching frequency with resistive load, max. with inductive load, max. on lamp load, max. Current of the outputs Current per module, max. shielded, max. unshielded, max. unshielded, max. 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) Input voltage 50 μs 50 μs 50 μs 50 μs 10 kHz 10 kHz 10 kHz 10 kHz 10 Hz 	for signal "0" residual current, max.	0.5 mA
• "1" to "0", max. Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. 10 Hz Total current of the outputs • Current per module, max. 1 A Cable length • shielded, max. • unshielded, max. • unshielded, max. • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 50 µs 10 Hz 1 A A Course (10 Hz) 10 MHz 10 Hz 1	Output delay with resistive load	
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • Current of the outputs • Current per module, max. • shielded, max. • unshielded, max. • unshielded, max. • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage	• "0" to "1", max.	50 μs
 with resistive load, max. with inductive load, max. 0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve on lamp load, max. 10 Hz Total current of the outputs Current per module, max. 1 A Cable length shielded, max. unshielded, max. 600 m Encoder Connectable encoders 2-wire sensor permissible quiescent current (2-wire sensor), max. 1.5 mA Encoder signals, incremental encoder (asymmetrical) Input voltage 24 V 	• "1" to "0", max.	50 μs
 with inductive load, max. 0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve on lamp load, max. 10 Hz Total current of the outputs Current per module, max. shielded, max. unshielded, max. unshielded, max. 600 m Encoder Connectable encoders 2-wire sensor permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) Input voltage 24 V	Switching frequency	
on lamp load, max. Total current of the outputs Current per module, max. 1 A Cable length shielded, max. 1000 m unshielded, max. 600 m Encoder Connectable encoders 2-wire sensor permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) Input voltage 1 A	-	10 kHz
on lamp load, max. Total current of the outputs Current per module, max. 1 A Cable length shielded, max. unshielded, max. toon mectable encoders 2-wire sensor permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) Input voltage 1 A 1 A 1 M 1 M 1 M 1 M 1 M 1 M	with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
Total current of the outputs • Current per module, max. 1 A Cable length • shielded, max. • unshielded, max. 600 m Encoder Connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 24 V		
Cable length Shielded, max. Unshielded, max. Unshielded		
Cable length • shielded, max. • unshielded, max. 600 m Encoder Connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 24 V		1 A
shielded, max. unshielded, max. 600 m Encoder Connectable encoders 2-wire sensor permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) Input voltage 1 000 m 600 m 7 yes 1.5 mA		
unshielded, max. 600 m Connectable encoders 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) Input voltage 24 V		1 000 m
Connectable encoders • 2-wire sensor Yes — permissible quiescent current (2-wire sensor), max. 1.5 mA Encoder signals, incremental encoder (asymmetrical) • Input voltage 24 V		
Connectable encoders • 2-wire sensor — permissible quiescent current (2-wire sensor), max. Encoder signals, incremental encoder (asymmetrical) • Input voltage 24 V		000 111
● 2-wire sensor — permissible quiescent current (2-wire sensor), max. 1.5 mA Encoder signals, incremental encoder (asymmetrical) • Input voltage 24 V		
— permissible quiescent current (2-wire sensor), max. 1.5 mA Encoder signals, incremental encoder (asymmetrical) Input voltage 24 V	Connectable encoders	
Encoder signals, incremental encoder (asymmetrical) ● Input voltage 24 V	• 2-wire sensor	Yes
• Input voltage 24 V	— permissible quiescent current (2-wire sensor), max.	1.5 mA
	Encoder signals, incremental encoder (asymmetrical)	
■ Input frequency, max. 200 kHz	Input voltage	24 V
	Input frequency, max.	200 kHz

Counting frequency, max.	800 kHz; with quadruple evaluation
 Cable length, shielded, max. 	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
 Incremental encoder with A/B tracks, 90° phase offset and zero track 	Yes
• pulse encoder	Yes
 pulse encoder with direction 	Yes
pulse encoder with one impulse signal per count direction	Yes
Interface types	
 Source/sink input 	Yes
 Input characteristic curve in accordance with IEC 61131, type 3 	Yes
Interrupts/diagnostics/status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
Diagnostic alarm	Yes
Hardware interrupt	Yes
Diagnoses	
Monitoring the supply voltage	Yes
Wire-break	Yes
Short-circuit	Yes
A/B transition error at incremental encoder	Yes
Group error	Yes
Diagnostics indication LED	
Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Channel status display	Yes; green LED
• for module diagnostics	Yes; green/red DIAG LED
Status indicator forward counting (green)	Yes
Status indicator backward counting (green)	Yes
	Tes
Integrated Functions	
Integrated Functions	Ven
Counter	Yes
Counter • Number of counters	1
Counter • Number of counters • Counting frequency, max.	1 800 kHz; with quadruple evaluation
Counter • Number of counters • Counting frequency, max. Fast mode	1
Counter • Number of counters • Counting frequency, max. Fast mode Counting functions	1 800 kHz; with quadruple evaluation Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter	1 800 kHz; with quadruple evaluation Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting	1 800 kHz; with quadruple evaluation Yes Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators — Direction dependency	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program Position detection Incremental acquisition	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator — Number of comparators — Direction dependency — Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator — Number of comparators — Direction dependency — Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions Measuring time, parameterizable	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator — Number of comparators — Direction dependency — Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions Measuring time, parameterizable Dynamic measurement period adjustment	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions Measuring time, parameterizable Dynamic measurement period adjustment Number of thresholds, parameterizable	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions Measuring time, parameterizable Dynamic measurement period adjustment Number of thresholds, parameterizable Measuring range	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions Measuring time, parameterizable Dynamic measurement period adjustment Number of thresholds, parameterizable Measuring range Frequency measurement, min.	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Counter Number of counters Counting frequency, max. Fast mode Counting functions Can be used with TO High_Speed_Counter Continuous counting Counter response parameterizable Hardware gate via digital input Software gate Event-controlled stop Synchronization via digital input Counting range, parameterizable Comparator Number of comparators Direction dependency Can be changed from user program Position detection Incremental acquisition Suitable for S7-1500 Motion Control Measuring functions Measuring time, parameterizable Dynamic measurement period adjustment Number of thresholds, parameterizable Measuring range Frequency measurement, min. Frequency measurement, max.	1 800 kHz; with quadruple evaluation Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

Accuracy	400 many day and in a surprise interval and signal avaluation
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	Ver
between the channels and backplane bus	Yes
Isolation	707 V DO (h.m 44)
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	NI-
Suitable for safety functions Ambient conditions	No
Ambient temperature during operation	-40 °C; = Tmin (incl. condensation/frost)
horizontal installation, min.horizontal installation, max.	60 °C; = Tmax; +70 °C with configured empty slots to the left and right of the
• Horizontal installation, max.	module
vertical installation, min.	-40 °C; = Tmin (incl. condensation/frost)
 vertical installation, max. 	50 °C; = Tmax
• ceiling installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• ceiling installation, max.	50 °C; = Tmax
• floor installation, min.	-40 °C; = Tmin (incl. condensation/frost)
floor installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
 Installation altitude above sea level, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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)
Relative humidity	
 With condensation, tested in accordance with IEC 60068- 2-38, max. 	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
 Resistant to commercially available coolants and lubricants 	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
 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); *
 to mechanically active substances according to EN 60721-3-3 	Yes; Class 3S4 incl. sand, dust, *
 Against mechanical environmental conditions acc. to EN 60721-3-3 	Yes; Class 3M8 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Use on ships/at sea	
 to biologically active substances according to EN 60721-3-6 	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
 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); *
 to mechanically active substances according to EN 60721-3-6 	Yes; Class 6S3 incl. sand, dust; *
 Against mechanical environmental conditions acc. to EN 60721-3-6 	Yes; Class 6M4 using the SIPLUS Mounting Kit ET 200SP (6AG1193-6AA00-0AA0)
Usage in industrial process technology	
 Against chemically active substances acc. to EN 60654-4 	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)
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!
ANSI/ISA-71.04	

• Military testing according to MIL-I-46058C, Amendment 7 Yes; Discoloration of coating possible during service life • Qualification and Performance of Electrical Insulating Yes; Conformal coating, Class A Compound for Printed Board Assemblies according to IPC-CC-830A **Decentralized operation** to SIMATIC S7-300 Yes to SIMATIC S7-400 Yes to SIMATIC S7-1200 Yes to SIMATIC S7-1500 Yes to standard PROFIBUS master Yes Yes to standard PROFINET controller Width 15 mm Height 73 mm Depth 58 mm Weight, approx. 45 g

last modified: 5/5/2021 🖸