

SIC103

Safety Analog Input Module (0)4-20 mA

Combine safe analog signal acquisition and process control applications with maximum flexibility: this functionally safe (0)4–20 mA input module provides six inputs for applications up to SIL 2 / PL d / Category 3 and, when used in pairs, up to SIL 3 / PL e / Category 4. Support for 2-wire, 3-wire, and 4-wire sensors, together with the option of connecting additional current inputs downstream, provides maximum flexibility during system integration. This allows the current signal to be used for control applications independently of the safety evaluation.

High-precision measurements, equivalence monitoring with adjustable tolerance windows, and individually passivatable channels enhance flexible signal processing. Configurable SINC³ filters and dedicated notch filters for 50 Hz, 60 Hz, and 16.7 Hz enable application-specific signal filtering.

Part type designation	Part number
SIC103	On request
SIC103 EC	On request

Features

- 6x (0)4-20(25) mA inputs SIL2 / PLd / Cat 3; SIL3 / Ple / Cat. 4 through channel pairing
- 2/3/4-wire connection technology
- Additional non-safety-related 4–20 mA inputs can be connected downstream
- Configurable SINC³ filter
- Mains frequency suppression at 50 Hz, 60 Hz, or 16.7 Hz
- Configurable tolerance band windows
- Data preprocessing within the module

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Common properties	
Basic function	6x safety 4-20mA input 6x configurable filters 3x tolerance-band comparison
System	Bachmann system M100
Fail safe analog inputs – current	
Number of analog inputs	6
Signal standard	4-20 mA
Measurement range	0-25 mA
Resolution (ADC)	16 bit
Accuracy at T_a = -30 °C to +70 °C	Measuring range 4 to 20 mA: 0.4 % FS, Safety accuracy: 1 % FS
Connections per input	4
Overvoltage protection	±40 V to GND
Internal scan rate, max.	1 kHz
Digital low pass filter cut-off frequency	4.37 Hz; 5.24 Hz; 13.0 Hz,15.3 Hz; 26 Hz, 51.7 Hz; 125 Hz
Digital low pass filter slope	> 60 dB/decade (SINC3)
Input impedance	100 Ω
Signal cable length, shielded, max.	1000 m [1)]
Signal cable length, unshielded, max.	3 m
Oversampling	No
Process data	Analog value Analog value with intermediate values Diagnostics channel quality information
Time stamps	No

[1)] *Depending on the measuring range used and the required accuracy, shorter line lengths must be provided.*

Sensor supply 24 V DC	
Number of supply points 24 V DC	6
Output current per channel, nominal, continuous	500 mA
Short-circuit protected, supply	Yes
Overvoltage protection	-40 V to + 40 V
Module-to-module communication	
Signal propagation to neighbour	No
Signal receiver from neighbor modules	No
Module bus interface	
Slot type	IO (1/E, 2, 3, 4, ...31)

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Diagnostics	
Electronic type plate	Yes (application interface and in the engineering tool)
Machine readable type plate	Yes (application interface and in the engineering tool)
Environmental conditions sensor	Integrated (temperature)
Operational indications	LED "MOD" (red/green) module status LED "CH" (red/green) channel status summary LED "SAF" (red/green) safety status Numeric LED per channel (green) digital level of the channel
Powerfail, logic supply	Yes
Powerfail, signal supply	Yes
Overload/short-circuit	Yes, sensor supply
Open circuit	Yes, per output channel (measurement channel)
Measurement range monitoring	Yes, upper/lower limit (all analog input signals)
Configurable threshold monitoring	Yes, upper/lower limit (all analog input signals)
Energy supply	
Supply voltage, nominal	24 V DC
Supply voltage, range	18 V DC to 32 V DC
Supply voltage, short-term overload	40 V permanent
Maximum residual ripple 24 V signal supply	±2.4 V
Overcurrent protection required	No internal protection External protection with circuit breaker characteristic: B, C, D, Z or K Max. nominal current 8 A DC
Power dissipation, typ./max.	< 2.5 W
Reverse polarity protection signal supply	Yes, continuously (up to -40 V)
Supply terminal block bridge	Yes, internal connection from 1+ to 2+, and 1- to 2-
Product safety	
Galvanic isolation	850 V AC
Galvanic isolation between supply groups	No
Protection class acc. IEC 61010-1, IEC 61010-2-201	III
Overvoltage category acc. IEC 61010-1	II
Rated impulse withstand voltage acc. IEC 61000-4-5	Supply DC: • 500 V DM • 1000 V CM
Short-circuit protected, outputs	Yes, continuously
Keying of terminal block	Yes (6-fold per 4 contacts)

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Environmental conditions	
Temperature range, operating	-30 °C to +70 °C
Temperature range, transport and storage	-40 °C to +85 °C
Installation altitude, max.	Up to 2000 m without temperature derating 2000 m to 4500 m: Reduction of the max. ambient temperature by 0.1 °C per 100 m elevation
Air pressure	106 kPa to 58 kPa (0 m to 4500 m)
Relative humidity, operation	Standard: 0 % to 100 % noncondensing Extended Climate: 0 % to 100 % with temporary condensation
Pollution degree acc. IEC 61010-1	Standard: 2, noncondensing Extended Climate: 2
Vibration	6 g (14.1 Hz to 500 Hz) 7.5 mm amplitude (2 Hz to 14.1 Hz) Test duration: 15 h
Shock	45 g max. (test scope 18 shocks) 20 g permanently (test scope 6000 shocks)
Approvals/certificates	
Functional safety	Yes: IEC 61508, IEC 62061, IEC 61131, ISO 13849 (SIL 3 / PLe / Cat. 4)
Hazard area operation	ATEX: Ex II 3G Ex ec IIC Gc: in preparation
Maritime	ABS, BV, ClassNK, DNV, KR, LR, RINA: in preparation
Hazardous substances and waste treatment	RoHS, RoHS China, REACH, WEEE
Quality management	ISO 9001 for development and production

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Accessories

Part type designation	Part number	Description
BPR1nn	00039235-nn	Backplane for DIN-rail mounting Active backplane system M100: BPR1nn with nn = 04 to 16 slots in increments of 1, as well as 20, 24, 28, 32 slots, for DIN-rail mounting; delivery without backplane slot covers and without mounting rail
BPR1nn EC	00039236-nn	Like BPR1nn; Extended Climate Range
BPS1nn	00039237-nn	Backplane for direct screw mounting Active backplane system M100: BPS1nn with nn = 04 to 16 slots in increments of 1, as well as 20, 24, 28, 32 slots, for direct screw mounting; delivery without backplane slot covers and without screws
BPS1nn EC	00039238-nn	Like BPS1nn; Extended Climate Range
TPI100_W24_P5.0_Cgy_L1to24		Signal terminal block Completely removable terminal block, push-in spring connector for system M100, 24-way/contacts, pitch 5.0 mm, female, conductors flexible 0.2 mm² to 2.5 mm² (24 to 14 AWG), solid 0.2 mm² to 1.5 mm² (24 to 16 AWG), with wire end ferrules 0.25 mm² to 1.5 mm² (24 to 16 AWG), stripping length: 10 mm, rating: 300 V / 8 A per contact, connector color: gray, push-release: yellow, labeling: 1 to 24
TPI100_W4_P5.0_Cgy_Lsup		Supply terminal block Completely removable terminal block, push-in spring connector for system M100, 4-way/contacts, pitch 5.0 mm, female, conductors flexible 0.2 mm² to 2.5 mm² (24 to 14 AWG), solid 0.2 mm² to 1.5 mm² (24 to 16 AWG), with wire end ferrules 0.25 mm² to 1.5 mm² (24 to 16 AWG), stripping length: 10 mm, rating: 300 V / 8 A per contact, connector color: gray, push-release: yellow, labeling: 1+/1-/2+/2-
TKP106		Keying element Keying element for signal terminal blocks and supply terminal blocks TPI100 for system M100, plastic ring with 6 keying elements
TPI100_W24_W4_Set [1)]	00042412-00	Terminal block set for M100 standard modules: • 1x TPI100_W24_P5.0_Cgy_L1to24 • 1x TPI100_W4_P5.0_Cgy_Lsup • 2x TKP106

[1)] *All components of the set are also available in bulk packages.*

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