Data sheet



SIPLUS ET 200SP 4xAl 2-wire 4-20 mA HART -40...+60°C start up 25°C with conformal coating based on 6ES7134-6TD00-0CA1 . Analog HART input module, Al 4Xl 2-wire HART High-Feature suitable for BU type A0, A1, Color code CC03, channel diagnostics, 16 bit, +/-0.3%

General information	
Product type designation	AI 4xI 2-wire HART
Firmware version	
 FW update possible 	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC03
Product function	
● I&M data	Yes; I&M0 to I&M3
Isochronous mode	No
 Measuring range scalable 	No
Engineering with	
 PROFIBUS as of GSD version/GSD revision 	GSD Revision 5
 PROFINET as of GSD version/GSD revision 	GSDML V2.3
Operating mode	
Oversampling	No
• MSI	No
CiR – Configuration in RUN	

Calibration possible in RUN Supply voltage Rated value (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) Reverse polarity protection Pes Input current Current consumption, max. 25 mA: without sensor supply - 24 V		
Supply voltage Rated value (DC)	Reparameterization possible in RUN	Yes
Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) 28.8 V Reverse polarity protection Ves Input current Current consumption, max. 25 mA; without sensor supply 24 V encoder supply 25 vay Short-circuit protection Output current, max. 20 mA; max. 50 mA per channel for a duration < 10 s Power loss Power loss Power loss, typ. Address space per module Address space per module, max. Address space per module with HART, max. 8 byte; +1 byte for Ql information Analog inputs Number of analog inputs permissible input current for current input (destruction limit), max. Input ranges (rated values), currents 0 to 20 mA 4 mA to 20 mA - 20 mA to +20 mA - 4 mA to 20 mA - Input resistance (4 mA to 20 mA) - Input resistance (4 mA to 20 mA) - Shelded, max. 800 m Analog value generation for the inputs Measurement principle integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for 10 / 50 / 60 Hz	Calibration possible in RUN	No
permissible range, lower limit (DC) 28.8 V Reverse polarity protection Yes Reverse polarity protection 25 mA; without sensor supply Encoder supply 24 V encoder supply • 26 mA; without sensor supply • 27 V encoder supply • 28 V encoder supply • 29 V encoder supply • 20 mA; max. 50 mA per channel for a duration < 10 s Power loss, typ. 0.65 W; without sensor supply Address area Address space per module • Address space per module max. 8 byte; + 1 byte for QI information • Address space per module with HART, max. 28 byte; + 1 byte for QI information Analog inputs Power of analog inputs 4; Differential inputs permissible input current for current input (destruction limit), max. Input ranges (rated values), currents • 0 to 20 mA No • 20 mA to +20 mA Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Input resistance (4 mA to 20 mA) Yes; 15 bit + sign — Integration firm (5 mA) Yes; 15 bit + sign — Integration for the inputs Analog value generation for the inputs Integration into, parameterizable Yes; channel by channel • Integration time, parameterizable Yes; channel by channel • Integration time, parameterizable	Supply voltage	
permissible range, upper limit (DC) Reverse polarity protection Yes Input current Current consumption, max. 25 mA; without sensor supply 24 V encoder supply 24 V Yes • Short-circuit protection • Output current, max. Power loss Power loss, typ. Address space per module • Address space per module with HART, max. Analog inputs Number of analog inputs permissible input current for current input (destruction limit), max. Input ranges (rated values), currents • 0 to 20 mA • 20 mA • 1 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 4 mA to 20 mA • 5 shielded, max. Analog value generation for the inputs Messurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration and conversion time/resolution per channel • Ness (channel by channel • Integration time, parameterizable • Integration and conversion time/resolution per channel	Rated value (DC)	24 V
Reverse polarity protection Yes	permissible range, lower limit (DC)	19.2 V
Input current Current consumption, max. 25 mA; without sensor supply Encoder supply 24 V encoder supply • 24 V	permissible range, upper limit (DC)	28.8 V
Encoder supply 24 V encoder supply 24 V encoder supply 24 V es Short-circuit protection Output current, max. 20 mA; max. 50 mA per channel for a duration < 10 s Power loss Power loss, typ. 0.65 W; without sensor supply Address area Address space per module Address space per module, max. Address space per module with HART, max. Analog inputs Number of analog inputs permissible input current for current input (destruction limit), max. Input ranges (rated values), currents 0 to 20 mA A to 20 mA A to 20 mA A to 20 mA Input resistance (4 mA to 20 mA) — Input resistance (4 mA to 20 mA) — Input resistance (4 mA to 20 mA) Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable	Reverse polarity protection	Yes
Encoder supply 24 V encoder supply • 24 V • Short-circuit protection • Output current, max. 20 mA; max. 50 mA per channel for a duration < 10 s Power loss Power loss, typ. Address area Address space per module • Address space per module, max. • Address space per module with HART, max. 8 byte; + 1 byte for QI information • Address space per module with HART, max. 28 byte; + 1 byte for QI information Analog inputs Permissible input current for current input (destruction limit), max. Input ranges (rated values), currents • 0 to 20 mA • -20 mA to +20 mA • -20 mA to +20 mA — Input resistance (4 mA to 20 mA) — Input resistance (4 mA to 20 mA) — Input resistance (4 mA to 20 mA) — Shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable	Input current	
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• 24 V • Short-circuit protection • Output current, max. 20 mA; max. 50 mA per channel for a duration < 10 s Power loss Power loss, typ. 0.65 W; without sensor supply Address area Address space per module • Address space per module, max. • Address space per module with HART, max. 8 byte; + 1 byte for Ql information 28 byte; + 1 byte for Ql information Analog inputs Number of analog inputs Power loss with HART, max. Analog inputs Number of analog inputs Power loss with HART, max. Analog inputs Number of analog inputs Power loss with HART, max. Analog inputs Number of analog inputs Power loss with HART, max. Analog inputs No 10 to 20 mA 1	Encoder supply	
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Address area Address space per module • Address space per module, max. • Address space per module with HART, max. 8 byte; + 1 byte for QI information 28 byte; + 1 byte for QI information Analog inputs Number of analog inputs Permissible input current for current input (destruction limit), max. Input ranges (rated values), currents • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA — Input resistance (4 mA to 20 mA) Cable length • shielded, max. 800 m Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration time, parameterizable • Integrerence voltage suppression for	Power loss	
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 • 0 to 20 mA • -20 mA to +20 mA • 4 mA to 20 mA — Input resistance (4 mA to 20 mA) Z80 Ω; + approx. 0.35 V diode forward voltage Cable length • shielded, max. Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration time, parameterizable • Interference voltage suppression for Voltage Voltage Voltage Voltage Voltage Ves; channel by channel 10 / 50 / 60 Hz 		50 mA
 -20 mA to +20 mA 4 mA to 20 mA — Input resistance (4 mA to 20 mA) 280 Ω; + approx. 0.35 V diode forward voltage Cable length • shielded, max. Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integration evoltage suppression for 10 / 50 / 60 Hz 	Input ranges (rated values), currents	
 4 mA to 20 mA — Input resistance (4 mA to 20 mA) 280 Ω; + approx. 0.35 V diode forward voltage Cable length • shielded, max. 800 m Analog value generation for the inputs Measurement principle integrating (Sigma-Delta) Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable yes; channel by channel • Interference voltage suppression for 10 / 50 / 60 Hz 	• 0 to 20 mA	No
 4 mA to 20 mA — Input resistance (4 mA to 20 mA) 280 Ω; + approx. 0.35 V diode forward voltage Cable length • shielded, max. 800 m Analog value generation for the inputs Measurement principle integrating (Sigma-Delta) Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable yes; channel by channel • Interference voltage suppression for 10 / 50 / 60 Hz 	● -20 mA to +20 mA	No
— Input resistance (4 mA to 20 mA) Cable length • shielded, max. 800 m Analog value generation for the inputs Measurement principle Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Integreence voltage suppression for 280 Ω; + approx. 0.35 V diode forward voltage 800 m 16 bit Yes; channel by channel 10 / 50 / 60 Hz	• 4 mA to 20 mA	Yes; 15 bit + sign
shielded, max. Analog value generation for the inputs Measurement principle integrating (Sigma-Delta) Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Yes; channel by channel Interference voltage suppression for 10 / 50 / 60 Hz	— Input resistance (4 mA to 20 mA)	280 $Ω$; + approx. 0.35 V diode forward voltage
Analog value generation for the inputs Measurement principle integrating (Sigma-Delta) Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Yes; channel by channel Interference voltage suppression for 10 / 50 / 60 Hz	Cable length	
Measurement principle integrating (Sigma-Delta) Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Yes; channel by channel Interference voltage suppression for 10 / 50 / 60 Hz	• shielded, max.	800 m
Measurement principle integrating (Sigma-Delta) Integration and conversion time/resolution per channel Resolution with overrange (bit including sign), max. Integration time, parameterizable Yes; channel by channel Interference voltage suppression for 10 / 50 / 60 Hz	Analog value generation for the inputs	
 Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for 16 bit Yes; channel by channel 10 / 50 / 60 Hz 		integrating (Sigma-Delta)
max. • Integration time, parameterizable • Interference voltage suppression for Yes; channel by channel 10 / 50 / 60 Hz		
max. ● Integration time, parameterizable ● Interference voltage suppression for Yes; channel by channel 10 / 50 / 60 Hz	 Resolution with overrange (bit including sign), 	16 bit
• Interference voltage suppression for 10 / 50 / 60 Hz		
	• Integration time, parameterizable	Yes; channel by channel
interierence irequency i i in nz	 Interference voltage suppression for interference frequency f1 in Hz 	10 / 50 / 60 Hz
Smoothing of measured values		

Number of smoothing levels	4; None; 4/8/16 times
• parameterizable	Yes

paramotonzablo	
Encoder	
Connection of signal encoders	
for voltage measurement	No
• for current measurement as 2-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	60 dB
Repeat accuracy in steady state at 25 °C (relative to	0.05 %

Operational error limit in overall temperature range	
Current, relative to input range, (+/-)	1 %

Basic error limit (operational limit at 25 °C)	
 Current, relative to input range, (+/-) 	0.3 %

Interference voltage suppression	for $f = n \times (f1 +$	+/- 1 %), f1 =	interference frequency

• Series mode interference (peak value of interference < rated value of input range), min.

input range), (+/-)

60 dB

Interrupts/diagnostics/status information		
Diagnostics function	Yes	
Alarms		
Diagnostic alarm	Yes	
Limit value alarm	Yes	
Diagnostic messages		
Monitoring the supply voltage	Yes	
Wire-break	Yes; channel by channel	
Short-circuit	Yes; Channel-by-channel, short-circuit of the encoder supply to	
	ground or of an input to the encoder supply	
Group error	Yes	
Overflow/underflow	Yes; channel by channel	
Diagnostics indication LED		
Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	
Channel status display	Yes; green LED	
• for channel diagnostics	Yes; red LED	

Potential separation	
Potential separation channels	
between the channels	No
• between the channels and backplane bus	Yes

• for module diagnostics

Yes; green/red DIAG LED

• between the channels and the power supply of the electronics

No

Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
 horizontal installation, max. 	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax
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 1 140 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)
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 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); *
 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!
Conformal coating	
 Coatings for printed circuit board assemblies acc. to EN 61086 	Yes; Class 2 for high reliability
 Protection against fouling acc. to EN 60664-3 	Yes; Type 1 protection
 Military testing according to MIL-I-46058C, Amendment 7 	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
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	31 g

06/16/2020

last modified: