



SIPLUS S7-1500 AI 8XU/I/RTD/TC -25 ... +70 DEGREES C WITH CONFORMAL COATING BASED ON 6ES7531-7KF00-0AB0 . ANALOG INPUT MODULE 16 BITS OF RESOLUTION, ACCURACY 0.3 %; 8 CHANNELS IN GROUPS OF 8; COMMON MODE VOLTAGE APPR. 10 V; DIAGNOSIS, PROCESSALARMS INCL. INFEEED ELEMENT, SHIELD CLAMP AND SHIELD TERMINAL

Figure similar

General information	
Product type designation	AI 8xU/I/RTD/TC ST
HW functional status	E01
Firmware version	V1.0.0
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V12 / V12
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
CiR – Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
Supply voltage	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes

Input current	
Current consumption, max.	240 mA; with 24 V DC supply
Power	
Power available from the backplane bus	0.7 W
Power loss	
Power loss, typ.	2.7 W
Analog inputs	
Number of analog inputs	8
• For current measurement	8
• For voltage measurement	8
• For resistance/resistance thermometer measurement	4
• For thermocouple measurement	8
permissible input voltage for voltage input (destruction limit), max.	28.8 V
permissible input current for current input (destruction limit), max.	40 mA
Technical unit for temperature measurement adjustable	Yes
Input ranges (rated values), voltages	
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	100 k Ω
• -1 V to +1 V	Yes
• Input resistance (-1 V to +1 V)	10 M Ω
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 k Ω
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	10 M Ω
• -250 mV to +250 mV	Yes
• Input resistance (-250 mV to +250 mV)	10 M Ω
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	100 k Ω
• -50 mV to +50 mV	Yes
• Input resistance (-50 mV to +50 mV)	10 M Ω
• -500 mV to +500 mV	Yes
• Input resistance (-500 mV to +500 mV)	10 M Ω
• -80 mV to +80 mV	Yes
• Input resistance (-80 mV to +80 mV)	10 M Ω
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	25 Ω ; Plus approx. 42 ohms for overvoltage protection by PTC

• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
Input ranges (rated values), thermocouples	
• Type B	Yes
• Input resistance (Type B)	10 MΩ
• Type E	Yes
• Input resistance (Type E)	10 MΩ
• Type J	Yes
• Input resistance (type J)	10 MΩ
• Type K	Yes
• Input resistance (Type K)	10 MΩ
• Type N	Yes
• Input resistance (Type N)	10 MΩ
• Type R	Yes
• Input resistance (Type R)	10 MΩ
• Type S	Yes
• Input resistance (Type S)	10 MΩ
• Type T	Yes
• Input resistance (Type T)	10 MΩ
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
• Input resistance (Ni 100)	10 MΩ
• Ni 1000	Yes; Standard/climate
• Input resistance (Ni 1000)	10 MΩ
• LG-Ni 1000	Yes; Standard/climate
• Input resistance (LG-Ni 1000)	10 MΩ
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	10 MΩ
• Pt 1000	Yes; Standard/climate
• Input resistance (Pt 1000)	10 MΩ
• Pt 200	Yes; Standard/climate
• Input resistance (Pt 200)	10 MΩ
• Pt 500	Yes; Standard/climate
• Input resistance (Pt 500)	10 MΩ
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 MΩ

• 0 to 600 ohms	Yes
• Input resistance (0 to 600 ohms)	10 MΩ
• 0 to 6000 ohms	Yes
• Input resistance (0 to 6000 ohms)	10 MΩ
• PTC	Yes
• Input resistance (PTC)	10 MΩ
Thermocouple (TC)	
Temperature compensation	
— external temperature compensation via RTD	Yes
— Compensation for 0 °C reference point temperature	Yes; fixed value can be set
Cable length	
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
— additional conversion time for wire-break monitoring	9 ms
— additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
Smoothing of measured values	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
Encoder	
Connection of signal encoders	
• for resistance measurement with two-wire connection	Yes; Only for PTC
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.02 %

Temperature error (relative to input range), (+/-)	0.005 %/K; with TC type T 0.02 +/- %/K
Crosstalk between the inputs, max.	-80 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.02 %
Temperature error of internal compensation	+/-6 °C
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) • Thermocouple, relative to input range, (+/-)	0.3 % 0.3 % 0.3 % Ptxxx standard: ± 1.5 K, Ptxxx climate: ± 0.5 K, Nixxx standard: ± 0.5 K, Nixxx climate: ± 0.3 K Type B: > 600 °C ± 4.6 K, type E: > -200 °C ± 1.5 K, type J: > -210 °C ± 1.9 K, type K: > -200 °C ± 2.4 K, type N: > -200 °C ± 2.9 K, type R: > 0 °C ± 4.7 K, type S: > 0 °C ± 4.6 K, type T: > -200 °C ± 2.4 K
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) • Thermocouple, relative to input range, (+/-)	0.1 % 0.1 % 0.1 % Ptxxx standard: ± 0.7 K, Ptxxx climate: ± 0.2 K, Nixxx standard: ± 0.3 K, Nixxx climate: ± 0.15 K Type B: > 600 °C ± 1.7 K, type E: > -200 °C ± 0.7 K, type J: > -210 °C ± 0.8 K, type K: > -200 °C ± 1.2 K, type N: > -200 °C ± 1.2 K, type R: > 0 °C ± 1.9 K, type S: > 0 °C ± 1.9 K, type T: > -200 °C ± 0.8 K
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min. • Common mode voltage, max. • Common mode interference, min.	40 dB 10 V 60 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm • Limit value alarm	Yes Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Monitoring the supply voltage • Wire-break • Overflow/underflow	Yes Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD Yes
Diagnostics indication LED	
• RUN LED • ERROR LED • Monitoring of the supply voltage (PWR-LED)	Yes; Green LED Yes; Red LED Yes; Green LED

• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED

Potential separation

Potential separation channels

• between the channels	No
• between the channels, in groups of	8
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes

Permissible potential difference

between the inputs (UCM)	20 V DC
Between the inputs and MANA (UCM)	10 V DC
between M internally and the inputs	75 V DC/60 V AC (base isolation)

Isolation

Isolation tested with	707 V DC (type test)
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Ambient conditions

Ambient temperature during operation

• horizontal installation, min.	-25 °C; = Tmin
• horizontal installation, max.	70 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax

Extended ambient conditions

• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
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Relative humidity

— With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
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Resistance

— against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
— against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
— against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!

Decentralized operation

Fast Startup supported	No
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Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	310 g
Other	
Note:	Additional basic error and noise for integration time = 2.5 ms: Voltage: ± 250 mV ($\pm 0.02\%$), ± 80 mV ($\pm 0.05\%$), ± 50 mV ($\pm 0.05\%$); resistance: 150 ohms $\pm 0.02\%$; resistance thermometer: Pt100 climate: ± 0.08 K, Ni100 climate: ± 0.08 K; thermocouple: Type B, R, S: ± 3 K, type E, J, K, N, T: ± 1 K
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