

SIPLUS S7-1500 AI 8xU//RTD/TC -40°C ... +70°C with conformal coating based on 6ES7531-7KF00-0AB0 . Analog input module 16 bit resolution, Accuracy 0.3%, 8 channels in "groups of 8, ""Common mode" "voltage 10 V;"" ""diagnostics;" "hardware interrupts"" incl." infeed element, Shield bracket and shield terminal



Figure similar

| General information | |
|-------------------------------------|-------------------|
| Product type designation | AI 8xU//RTD/TC ST |
| Product function | |
| • I&M data | Yes; I&M0 to I&M3 |
| CiR – Configuration in RUN | |
| Reparameterization possible in RUN | Yes |
| Calibration possible in RUN | Yes |
| Supply voltage | |
| Type of supply voltage | DC |
| Rated value (DC) | 24 V |
| permissible range, lower limit (DC) | 20.4 V |
| permissible range, upper limit (DC) | 28.8 V |
| Encoder supply | |
| 24 V encoder supply | |
| • Short-circuit protection | Yes |
| • Output current, max. | 53 mA |

| 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; > +60 °C max. 2x ±20 mA or 4x ±10 V or 4x RTD permissible |
| <ul style="list-style-type: none"> • For current measurement | 8 |
| <ul style="list-style-type: none"> • For voltage measurement | 8 |
| <ul style="list-style-type: none"> • For resistance/resistance thermometer measurement | 4 |
| <ul style="list-style-type: none"> • 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; °C/°F/K |
| Input ranges (rated values), voltages | |
| <ul style="list-style-type: none"> • 1 V to 5 V | Yes |
| <ul style="list-style-type: none"> • Input resistance (1 V to 5 V) | 100 kΩ |
| <ul style="list-style-type: none"> • -1 V to +1 V | Yes |
| <ul style="list-style-type: none"> • Input resistance (-1 V to +1 V) | 10 MΩ |
| <ul style="list-style-type: none"> • -10 V to +10 V | Yes |
| <ul style="list-style-type: none"> • Input resistance (-10 V to +10 V) | 100 kΩ |
| <ul style="list-style-type: none"> • -2.5 V to +2.5 V | Yes |
| <ul style="list-style-type: none"> • Input resistance (-2.5 V to +2.5 V) | 10 MΩ |
| <ul style="list-style-type: none"> • -250 mV to +250 mV | Yes |
| <ul style="list-style-type: none"> • Input resistance (-250 mV to +250 mV) | 10 MΩ |
| <ul style="list-style-type: none"> • -5 V to +5 V | Yes |
| <ul style="list-style-type: none"> • Input resistance (-5 V to +5 V) | 100 kΩ |
| <ul style="list-style-type: none"> • -50 mV to +50 mV | Yes |
| <ul style="list-style-type: none"> • Input resistance (-50 mV to +50 mV) | 10 MΩ |
| <ul style="list-style-type: none"> • -500 mV to +500 mV | Yes |
| <ul style="list-style-type: none"> • Input resistance (-500 mV to +500 mV) | 10 MΩ |
| <ul style="list-style-type: none"> • -80 mV to +80 mV | Yes |
| <ul style="list-style-type: none"> • Input resistance (-80 mV to +80 mV) | 10 MΩ |
| Input ranges (rated values), currents | |
| <ul style="list-style-type: none"> • 0 to 20 mA | Yes |
| <ul style="list-style-type: none"> • Input resistance (0 to 20 mA) | 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC |
| <ul style="list-style-type: none"> • -20 mA to +20 mA | Yes |
| <ul style="list-style-type: none"> • 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 |
|------------------|--|

Encoder

Connection of signal encoders

| | |
|---|--|
| • for voltage measurement | Yes |
| • for current measurement as 2-wire transducer | Yes |
| — Burden of 2-wire transmitter, max. | 820 Ω |
| • for current measurement as 4-wire transducer | Yes |
| • 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, min. | -80 dB |
| Repeat accuracy in steady state at 25 °C (relative to input range), (+/-) | 0.02 % |

Operational error limit in overall temperature range

| | |
|--|---|
| • Voltage, relative to input range, (+/-) | 0.5 % |
| • Current, relative to input range, (+/-) | 0.5 % |
| • Resistance, relative to input range, (+/-) | 0.5 % |
| • Resistance thermometer, relative to input range, (+/-) | Ptxxx standard: ±1.5 K, Ptxxx climate: ±0.5 K, Nixxx standard: ±0.5 K, Nixxx climate: ±0.3 K |
| • Thermocouple, relative to input range, (+/-) | 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, (+/-) | 0.1 % |
| • Current, relative to input range, (+/-) | 0.1 % |

| | |
|--|--|
| <ul style="list-style-type: none"> • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) • Thermocouple, relative to input range, (+/-) | <p>0.1 %</p> <p>Ptxxx standard: ± 0.7 K, Ptxxx climate: ± 0.2 K, Nixxx standard: ± 0.3 K, Nixxx climate: ± 0.15 K</p> <p>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</p> |
| Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency | |
| <ul style="list-style-type: none"> • Series mode interference (peak value of interference < rated value of input range), min. • Common mode voltage, max. • Common mode interference, min. | <p>40 dB</p> <p>10 V</p> <p>60 dB</p> |

Interrupts/diagnostics/status information

| | |
|---|---|
| Diagnostics function | Yes |
| Alarms | |
| <ul style="list-style-type: none"> • Diagnostic alarm • Limit value alarm | <p>Yes</p> <p>Yes; two upper and two lower limit values in each case</p> |
| Diagnostic messages | |
| <ul style="list-style-type: none"> • Monitoring the supply voltage • Wire-break • Overflow/underflow | <p>Yes</p> <p>Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD</p> <p>Yes</p> |
| Diagnostics indication LED | |
| <ul style="list-style-type: none"> • RUN LED • ERROR LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics | <p>Yes; Green LED</p> <p>Yes; Red LED</p> <p>Yes; Green LED</p> <p>Yes; Green LED</p> <p>Yes; Red LED</p> <p>Yes; Red LED</p> |

Potential separation

| | |
|--|--|
| Potential separation channels | |
| <ul style="list-style-type: none"> • between the channels • between the channels, in groups of • between the channels and backplane bus • between the channels and the power supply of the electronics | <p>No</p> <p>8</p> <p>Yes</p> <p>Yes</p> |

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) |
|-----------------------|----------------------|

Ambient conditions

| | |
|---|--|
| Ambient temperature during operation | |
| <ul style="list-style-type: none"> • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. | <p>-40 °C; = Tmin (incl. condensation/frost)</p> <p>70 °C; = Tmax</p> <p>-40 °C; = Tmin</p> <p>40 °C; = Tmax</p> |
| Altitude during operation relating to sea level | |
| <ul style="list-style-type: none"> • Installation altitude above sea level, max. • Ambient air temperature-barometric pressure-altitude | <p>5 000 m</p> <p>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)</p> |
| Relative humidity | |
| <ul style="list-style-type: none"> • With condensation, tested in accordance with IEC 60068-2-38, max. | <p>100 %; RH incl. condensation/frost (no commissioning under condensation conditions)</p> |
| Resistance | |
| Coolants and lubricants | |
| <ul style="list-style-type: none"> — Resistant to commercially available coolants and lubricants | <p>Yes; Incl. diesel and oil droplets in the air</p> |
| Use in stationary industrial systems | |
| <ul style="list-style-type: none"> — to biologically active substances according to EN 60721-3-3 — to chemically active substances according to EN 60721-3-3 — to mechanically active substances according to EN 60721-3-3 | <p>Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request</p> <p>Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 3S4 incl. sand, dust, *</p> |
| Use on ships/at sea | |
| <ul style="list-style-type: none"> — to biologically active substances according to EN 60721-3-6 — to chemically active substances according to EN 60721-3-6 — to mechanically active substances according to EN 60721-3-6 | <p>Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request</p> <p>Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *</p> <p>Yes; Class 6S3 incl. sand, dust; *</p> |
| Usage in industrial process technology | |
| <ul style="list-style-type: none"> — Against chemically active substances acc. to EN 60654-4 — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 | <p>Yes</p> <p>Yes</p> |
| Remark | |
| <ul style="list-style-type: none"> — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 | <p>* The supplied plug covers must remain in place over the unused interfaces during operation!</p> |
| Conformal coating | |

- Coatings for printed circuit board assemblies acc. to EN 61086
- Protection against fouling acc. to EN 60664-3
- Military testing according to MIL-I-46058C, Amendment 7
- Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A

Yes; Class 2 for high availability

Yes; Type 1 protection

Yes; Discoloration of coating possible during service life

Yes; Conformal coating, Class A

Dimensions

| | |
|--------|--------|
| Width | 35 mm |
| Height | 147 mm |
| Depth | 129 mm |

Weights

| | |
|-----------------|-------|
| Weight, approx. | 200 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 |
|-------|---|

last modified:

08/16/2019