



SIPLUS S7-1500 AI 8xU/I/RTD/TC TX rail based on 6ES7531-7KF00-0AB0 with conformal coating, -40...+70 °C, OT4 with ST1/2 (+85 °C for 10 minutes), analog input module 16-bit resolution, accuracy 0.3%, 8 channels in groups of 8, 4 channels for RTD measurement, common mode voltage 10 V; diagnostics; hardware interrupts including infeed element, shielding bracket and shield terminal

General information	
Product type designation	AI 8xU/I/RTD/TC ST
Firmware version	
• FW update possible	Yes
based on	6ES7531-7KF00-0AB0
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Prioritized startup	No
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	see entry ID: 109746275
Operating mode	
• Oversampling	No
• MSI	Yes
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
Supply voltage	
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.	255 mA; with 19.2 V supply
Encoder supply	
24 V encoder supply	
• Short-circuit protection	Yes
• Output current, max.	20 mA; Max. 47 mA per channel for a duration < 10 s
Power	
Power consumption 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
• For current measurement	8
• 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
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> • 0 to +5 V 	No
<ul style="list-style-type: none"> • 0 to +10 V 	No
<ul style="list-style-type: none"> • 1 V to 5 V <ul style="list-style-type: none"> — Input resistance (1 V to 5 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -1 V to +1 V <ul style="list-style-type: none"> — Input resistance (-1 V to +1 V) 	Yes 10 MΩ
<ul style="list-style-type: none"> • -10 V to +10 V <ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -2.5 V to +2.5 V <ul style="list-style-type: none"> — Input resistance (-2.5 V to +2.5 V) 	Yes 10 MΩ
<ul style="list-style-type: none"> • -25 mV to +25 mV 	No
<ul style="list-style-type: none"> • -250 mV to +250 mV <ul style="list-style-type: none"> — Input resistance (-250 mV to +250 mV) 	Yes 10 MΩ
<ul style="list-style-type: none"> • -5 V to +5 V <ul style="list-style-type: none"> — Input resistance (-5 V to +5 V) 	Yes 100 kΩ
<ul style="list-style-type: none"> • -50 mV to +50 mV <ul style="list-style-type: none"> — Input resistance (-50 mV to +50 mV) 	Yes 10 MΩ
<ul style="list-style-type: none"> • -500 mV to +500 mV <ul style="list-style-type: none"> — Input resistance (-500 mV to +500 mV) 	Yes 10 MΩ
<ul style="list-style-type: none"> • -80 mV to +80 mV <ul style="list-style-type: none"> — Input resistance (-80 mV to +80 mV) 	Yes 10 MΩ
Input ranges (rated values), currents	
<ul style="list-style-type: none"> • 0 to 20 mA <ul style="list-style-type: none"> — Input resistance (0 to 20 mA) 	Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
<ul style="list-style-type: none"> • -20 mA to +20 mA <ul style="list-style-type: none"> — Input resistance (-20 mA to +20 mA) 	Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
<ul style="list-style-type: none"> • 4 mA to 20 mA <ul style="list-style-type: none"> — Input resistance (4 mA to 20 mA) 	Yes 25 Ω; Plus approx. 42 ohms for overvoltage protection by PTC
Input ranges (rated values), thermocouples	
<ul style="list-style-type: none"> • Type B <ul style="list-style-type: none"> — Input resistance (Type B) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type C 	No
<ul style="list-style-type: none"> • Type E <ul style="list-style-type: none"> — Input resistance (Type E) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type J <ul style="list-style-type: none"> — Input resistance (type J) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type K <ul style="list-style-type: none"> — Input resistance (Type K) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type L 	No
<ul style="list-style-type: none"> • Type N <ul style="list-style-type: none"> — Input resistance (Type N) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type R <ul style="list-style-type: none"> — Input resistance (Type R) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type S <ul style="list-style-type: none"> — Input resistance (Type S) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type T <ul style="list-style-type: none"> — Input resistance (Type T) 	Yes 10 MΩ
<ul style="list-style-type: none"> • Type TXK/TXK(L) to GOST 	No
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> • Cu 10 	No

- Cu 10 according to GOST
- Cu 50
- Cu 50 according to GOST
- Cu 100
- Cu 100 according to GOST
- Ni 10
- Ni 10 according to GOST
- Ni 100
 - Input resistance (Ni 100)
- Ni 100 according to GOST
- Ni 1000
 - Input resistance (Ni 1000)
- Ni 1000 according to GOST
- LG-Ni 1000
 - Input resistance (LG-Ni 1000)
- Ni 120
- Ni 120 according to GOST
- Ni 200 according to GOST
- Ni 500
- Ni 500 according to GOST
- Pt 10
- Pt 10 according to GOST
- Pt 50
- Pt 50 according to GOST
- Pt 100
 - Input resistance (Pt 100)
- Pt 100 according to GOST
- Pt 1000
 - Input resistance (Pt 1000)
- Pt 1000 according to GOST
- Pt 200
 - Input resistance (Pt 200)
- Pt 200 according to GOST
- Pt 500
 - Input resistance (Pt 500)
- Pt 500 according to GOST

No
No
No
No
No
No
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No
No
No
No
No
No
No
No
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No
Yes; Standard/climate
10 MΩ
No

Input ranges (rated values), resistors

- 0 to 150 ohms
 - Input resistance (0 to 150 ohms)
- 0 to 300 ohms
 - Input resistance (0 to 300 ohms)
- 0 to 600 ohms
 - Input resistance (0 to 600 ohms)
- 0 to 3000 ohms
- 0 to 6000 ohms
 - Input resistance (0 to 6000 ohms)
- PTC
 - Input resistance (PTC)

Yes
10 MΩ
Yes
10 MΩ
Yes
10 MΩ
No
Yes
10 MΩ
Yes
10 MΩ
No

Thermocouple (TC)

Temperature compensation

- parameterizable
- internal temperature compensation
- external temperature compensation via RTD
- Compensation for 0 °C reference point temperature
- Reference channel of the module

Yes
Yes
Yes
Yes; fixed value can be set
Yes

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

<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. Integration time, parameterizable Integration time (ms) Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> — additional conversion time for wire-break monitoring — additional conversion time for resistance measurement Interference voltage suppression for interference frequency f_1 in Hz Time for offset calibration (per module) 	16 bit Yes 2,5 / 16,67 / 20 / 100 ms 9 / 23 / 27 / 107 ms 9 ms (to be considered in R/RTD/TC measurement) 150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms 400 / 60 / 50 / 10 Hz Basic conversion time of the slowest channel
Smoothing of measured values	
<ul style="list-style-type: none"> parameterizable Step: None Step: low Step: Medium Step: High 	Yes Yes Yes Yes Yes
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> for voltage measurement for current measurement as 2-wire transducer <ul style="list-style-type: none"> — Burden of 2-wire transmitter, max. for current measurement as 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with three-wire connection for resistance measurement with four-wire connection 	Yes Yes 820 Ω Yes Yes; Only for PTC Yes; All measuring ranges except PTC; internal compensation of the cable resistances 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 \pm % / 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	
<ul style="list-style-type: none"> 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, (+/-) 	0.4 % 0.4 % 0.4 % 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)	
<ul style="list-style-type: none"> 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	
<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. 	40 dB 10 V 60 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> Diagnostic alarm Limit value alarm 	Yes Yes; two upper and two lower limit values in each case
Diagnoses	

<ul style="list-style-type: none"> Monitoring the supply voltage 	Yes
<ul style="list-style-type: none"> Wire break 	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD
<ul style="list-style-type: none"> Overflow/Underflow 	Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> RUN LED 	Yes; green LED
<ul style="list-style-type: none"> ERROR LED 	Yes; red LED
<ul style="list-style-type: none"> Monitoring of the supply voltage (PWR-LED) 	Yes; green LED
<ul style="list-style-type: none"> Channel status display 	Yes; green LED
<ul style="list-style-type: none"> for channel diagnostics 	Yes; red LED
<ul style="list-style-type: none"> for module diagnostics 	Yes; red LED
Potential separation	
Potential separation channels	
<ul style="list-style-type: none"> between the channels 	No
<ul style="list-style-type: none"> between the channels, in groups of 	8
<ul style="list-style-type: none"> between the channels and backplane bus 	Yes
<ul style="list-style-type: none"> 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
Isolation	
Isolation tested with	750 V DC (type test) and according to EN 50155 (routine test)
Standards, approvals, certificates	
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E
Ecological footprint	
<ul style="list-style-type: none"> environmental product declaration 	Yes
Global warming potential	
— global warming potential, (total) [CO2 eq]	38.6 kg
— global warming potential, (during production) [CO2 eq]	14.4 kg
— global warming potential, (during operation) [CO2 eq]	24.6 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-0.44 kg
Railway application	
<ul style="list-style-type: none"> EN 50121-3-2 	Yes; EMC for rail vehicles
<ul style="list-style-type: none"> EN 50121-4 	Yes; EMC for signal and telecommunications systems
<ul style="list-style-type: none"> EN 50121-5 	Yes; EMC for fixed installations and railway power supply equipment
<ul style="list-style-type: none"> EN 50124-1 	Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC
<ul style="list-style-type: none"> EN 50125-1 	Yes; Rail vehicles - see ambient conditions
<ul style="list-style-type: none"> EN 50125-2 	Yes; Stationary electrical equipment - see ambient conditions
<ul style="list-style-type: none"> EN 50125-3 	Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)
<ul style="list-style-type: none"> EN 50155 	Yes; Rail vehicles - temperature class OT4, ST1/ST2, horizontal mounting position
<ul style="list-style-type: none"> EN 61373 	Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B
<ul style="list-style-type: none"> Fire protection acc. to EN 45545-2 	Yes; For proof of conformity, see Service & Support
Security	
signed firmware update	No
data integrity	No
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> horizontal installation, min. 	-40 °C; = Tmin (incl. condensation/frost)
<ul style="list-style-type: none"> horizontal installation, max. 	70 °C; = Tmax; +85 °C for 10 min (OT4, ST1/ST2 acc. to EN 50155)
<ul style="list-style-type: none"> vertical installation, min. 	-40 °C; = Tmin
<ul style="list-style-type: none"> vertical installation, max. 	40 °C; = Tmax
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> Installation altitude above sea level, max. 	2 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 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, *
Use on land craft, rail vehicles and special-purpose vehicles	
— to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
— to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
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
• Electronic equipment on rolling stock acc. to EN 50155	Yes; Class PC2 protective coating acc. to EN 50155:2017
• 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	35 mm
Height	147 mm
Depth	129 mm

Weights	
Weight, approx.	310 g

Other	
Note:	for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776

Classifications			
		Version	Classification
	eClass	14	27-24-22-01
	eClass	12	27-24-22-01
	eClass	9.1	27-24-22-01
	eClass	9	27-24-22-01
	eClass	8	27-24-22-01
	eClass	7.1	27-24-22-01
	eClass	6	27-24-22-01
	ETIM	10	EC001420
	ETIM	9	EC001420
	ETIM	8	EC001420

ETIM	7	EC001420
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval



[Manufacturer Declaration](#)



[China RoHS](#)



General Product Approval

EMV

Railway

Environment

[China RoHS](#)



[Confirmation](#)



last modified:

10/23/2025