SIEMENS

Data sheet 6AG1531-7PF00-4AB0

Figure similar

SIPLUS S7-1500 AI 8xU/R/RTD/TC HF based on 6ES7531-7PF00-0AB0 with conformal coating, 0…+60 °C, analog input module 16-bit resolution, accuracy 0.1%, 8 channels in groups of 1, common mode voltage: 30 V AC/60 V DC, diagnostics; hardware interrupts including infeed element, shielding bracket and shield terminal

General information	
Product type designation	AI 8xU/R/RTD/TC HF
Firmware version	
● FW update possible	Yes
based on	6ES7531-7PF00-0AB0
Product function	
● I&M data	Yes; I&M0 to I&M3
● Isochronous mode	No
● Prioritized startup	Yes
● Measuring range scalable	Yes
● Scalable measured values	No
● Adjustment of measuring range	No
Engineering with	
● PROFIBUS from GSD version/GSD revision	V1.0 / V5.1
● PROFINET from GSD version/GSD revision	V2.3 / -
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)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption, max.	55 mA; with 24 V DC supply
Power	
Power consumption from the backplane bus	0.85 W
Power loss	
Power loss, typ.	1.9 W
Analog inputs	
Number of analog inputs	8; Plus one additional RTD (reference) channel
● For voltage measurement	8; Plus one additional RTD (reference) channel
● For resistance/resistance thermometer measurement	8; Plus one additional RTD (reference) channel
● For thermocouple measurement	8; Plus one additional RTD (reference) channel
permissible input voltage for voltage input (destruction limit), max.	20 V

Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
● 0 to +5 V	No
● 0 to +10 V	No
● 1 V to 5 V	No
● -1 V to +1 V	Yes
— Input resistance (-1 V to +1 V)	10 MΩ
● -10 V to +10 V	No
● -2.5 V to +2.5 V	No
● -25 mV to +25 mV	Yes
— Input resistance (-25 mV to +25 mV)	10 MΩ
● -250 mV to +250 mV	Yes
— Input resistance (-250 mV to +250 mV)	10 MΩ
● -5 V to +5 V	No
● -50 mV to +50 mV	Yes
— Input resistance (-50 mV to +50 mV)	10 MΩ
● -500 mV to +500 mV	Yes
— Input resistance (-500 mV to +500 mV)	10 MΩ
● -80 mV to +80 mV	Yes
— Input resistance (-80 mV to +80 mV)	10 MΩ
Input ranges (rated values), currents	
● 0 to 20 mA	No
● -20 mA to +20 mA	No
● 4 mA to 20 mA	No
Input ranges (rated values), thermocouples	
● Type B	Yes
— Input resistance (Type B)	10 MΩ
● Type C	Yes
— Input resistance (Type C)	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 L	No
● 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
● Type TXK/TXK(L) to GOST	Yes
— Input resistance (Type TXK/TXK(L) to GOST)	10 MΩ
Input ranges (rated values), resistance thermometer	
● Cu 10	Yes; Standard/climate
— Input resistance (Cu 10)	10 MΩ
● Cu 10 according to GOST	Yes; Standard/climate
— Input resistance (Cu 10 according to GOST)	10 MΩ
● Cu 50	Yes; Standard/climate
— Input resistance (Cu 50)	10 MΩ
● Cu 50 according to GOST	Yes; Standard/climate
— Input resistance (Cu 50 according to GOST)	10 MΩ
● Cu 100	Yes; Standard/climate
— Input resistance (Cu 100)	10 MΩ
● Cu 100 according to GOST	Yes; Standard/climate
— Input resistance (Cu 100 according to GOST)	10 MΩ
● Ni 10	Yes; Standard/climate
— Input resistance (Ni 10)	10 MΩ

● Ni 10 according to GOST	Yes; Standard/climate
— Input resistance (Ni 10 according to GOST)	10 MΩ
● Ni 100	Yes; Standard/climate
— Input resistance (Ni 100)	10 MΩ
● Ni 100 according to GOST	Yes; Standard/climate
— Input resistance (Ni 100 according to GOST)	10 MΩ
● Ni 1000	Yes; Standard/climate
— Input resistance (Ni 1000)	10 MΩ
● Ni 1000 according to GOST	Yes; Standard/climate
— Input resistance (Ni 1000 according to GOST)	10 MΩ
● LG-Ni 1000	Yes; Standard/climate
— Input resistance (LG-Ni 1000)	10 MΩ
● Ni 120	Yes; Standard/climate
— Input resistance (Ni 120)	10 MΩ
● Ni 120 according to GOST	Yes; Standard/climate
— Input resistance (Ni 120 according to GOST)	10 MΩ
● Ni 200	Yes; Standard/climate
— Input resistance (Ni 200)	10 MΩ
● Ni 200 according to GOST	Yes; Standard/climate
— Input resistance (Ni 200 according to GOST)	10 MΩ
● Ni 500	Yes; Standard/climate
— Input resistance (Ni 500)	10 MΩ
● Ni 500 according to GOST	Yes; Standard/climate
— Input resistance (Ni 500 according to GOST)	10 MΩ
● Pt 10	Yes; Standard/climate
— Input resistance (Pt 10)	10 MΩ
● Pt 10 according to GOST	Yes; Standard/climate
— Input resistance (Pt 10 according to GOST)	10 MΩ
● Pt 50	Yes; Standard/climate
— Input resistance (Pt 50)	10 MΩ
● Pt 50 according to GOST	Yes; Standard/climate
— Input resistance (Pt 50 according to GOST)	10 MΩ
● Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	10 MΩ
● Pt 100 according to GOST	Yes; Standard/climate
— Input resistance (Pt 100 according to GOST)	10 MΩ
● Pt 1000	Yes; Standard/climate
— Input resistance (Pt 1000)	10 MΩ
● Pt 1000 according to GOST	Yes; Standard/climate
— Input resistance (Pt 1000 according to GOST)	10 MΩ
● Pt 200	Yes; Standard/climate
— Input resistance (Pt 200)	10 MΩ
● Pt 200 according to GOST	Yes; Standard/climate
— Input resistance (Pt 200 according to GOST)	10 MΩ
● Pt 500	Yes; Standard/climate
— Input resistance (Pt 500)	10 MΩ
● Pt 500 according to GOST	Yes; Standard/climate
— Input resistance (Pt 500 according to GOST)	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 3000 ohms	No
● 0 to 6000 ohms	Yes
— Input resistance (0 to 6000 ohms)	10 MΩ
● PTC	Yes
— Input resistance (PTC)	10 MΩ
Thermocouple (TC)	

Temperature compensation	
— parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation via RTD	Yes
— Compensation for 0 °C reference point temperature	Yes; fixed value can be set
— Reference channel of the module	Yes; 9th channel that can be used as a genuine 9th RTD channel regardless of the parameterization of the other channels, or that can be used for compensation in the case of TC measurement
Cable length	
● shielded, max.	800 m; at U; 200 m at R/RTD/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)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
● Basic conversion time, including integration time (ms)	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
— additional conversion time for wire-break monitoring	Thermocouples, 150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni50, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200: 4 ms; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt500, Pt1000: 13 ms
● Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz
Smoothing of measured values	
● parameterizable	Yes
● Step: None	Yes
● Step: low	Yes
● Step: Medium	Yes
● Step: High	Yes
Encoder	
Connection of signal encoders	
● for voltage measurement	Yes
● for current measurement as 2-wire transducer	No
● for current measurement as 4-wire transducer	No
● for resistance measurement with two-wire connection	Yes
● 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
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	±1,5 °C
Operational error limit in overall temperature range	
● Voltage, relative to input range, (+/-)	0.1 %
● Resistance, relative to input range, (+/-)	0.1 %
● Resistance thermometer, relative to input range, (+/-)	Cuxxx Standard: ±0.5 K, Cuxxx Klima: ±0.5 K, Ptxxx Standard: ±1 K, Ptxxx Klima: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Klima: ±0.3 K
● Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±2 K, Type E: > -200 °C ±1 K, Type J: > -210 °C ±1 K, Type K: > -200 °C ±2 K, Type N: > -200 °C ±2 K, Type R: > 0 °C ±2 K, Type S: > 0 °C ±2 K, Type T: > -200 °C ±1 K, Type C: ±4 K, Type TXK/TXK(L): ±1 K
Basic error limit (operational limit at 25 °C)	
● Voltage, relative to input range, (+/-)	0.05 %
● Resistance, relative to input range, (+/-)	0.05 %
● Resistance thermometer, relative to input range, (+/-)	Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K
● Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 K
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
● Series mode interference (peak value of interference < rated value of input range), min.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
● Common mode voltage, max.	60 V DC/30 V AC
● Common mode interference, min.	80 dB
Interrupts/diagnostics/status information	

Alarms	
● Diagnostic alarm	Yes
● Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
● Monitoring the supply voltage	Yes
● Wire-break	Yes; Only with TC, R, RTD
● Overflow/underflow	Yes
Diagnostics indication LED	
● RUN LED	Yes; green LED
● ERROR LED	Yes; red LED
● Monitoring of the supply voltage (PWR-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	Yes
● between the channels, in groups of	1
● between the channels and backplane bus	Yes
● between the channels and the power supply of the electronics	Yes
Isolation	
Isolation tested with	2 000 V DC between the channels and the supply voltage L+; 2 000 V DC between the channels and the backplane bus; 2 000 V DC between the channels; 707 V DC (type test) between the supply voltage L+ and the backplane bus
Standards, approvals, certificates	
Ecological footprint	
● 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
Ambient conditions	
Ambient temperature during operation	
● horizontal installation, min.	-30 °C; = Tmin (incl. condensation/frost)
● horizontal installation, max.	60 °C
● vertical installation, min.	-30 °C; = Tmin (incl. condensation/frost)
● vertical installation, max.	40 °C
Altitude during operation relating to sea level	
● Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 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 in bedewed state), horizontal installation
Resistance	
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 according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	290 g

Other

Note:	for the R/RDT three-wire measurement, the conductor compensation is made alternating with the measurement; this then requires two module cycles for a measured value

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	9	EC001420
ETIM	8	EC001420
ETIM	7	EC001420
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval

CE EG-Konf. | UKCA | Miscellaneous | UL | KC | RCM

EMV

RCM | RCM

For use in hazard-ous locations

FM

Maritime application

ABS | BUREAU VERITAS | DNV

Maritime application

Lloyd's Register LRS | NK / Nippon Kaiji Ky-okai | PRS | RINA | RMRS | CCS (China Classifica-tion Society)

Environment

EPD

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