

SIPPLUS ET 200SP, Analog input module, AI 4xRTD/TC High Feature, -40...+60 °C Start-up -25 °C with conformal coating based on 6ES7134-6JD00-0CA1 . suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.1% , 2-/3-/4-wire

General information

Product type designation	230 RCE
Product function	
<ul style="list-style-type: none"> I&M data 	Yes

Supply voltage

permissible range, lower limit (DC)	100 V
permissible range, upper limit (DC)	253 V
Reverse polarity protection	Yes

Input current

Current consumption, max.	40 mA
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Address area

Address space per module	
<ul style="list-style-type: none"> Address space per module, max. 	8 byte

Analog inputs

Number of analog inputs	0
permissible input voltage for voltage input (destruction limit), max.	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary
Technical unit for temperature measurement adjustable	Yes; °C/°F/K

Input ranges (rated values), voltages

<ul style="list-style-type: none"> -1 V to +1 V 	Yes; 16 bit incl. sign
<ul style="list-style-type: none"> Input resistance (-1 V to +1 V) 	10 MΩ
<ul style="list-style-type: none"> -250 mV to +250 mV 	Yes; 16 bit incl. sign
<ul style="list-style-type: none"> Input resistance (-250 mV to +250 mV) 	10 MΩ
<ul style="list-style-type: none"> -50 mV to +50 mV 	Yes; 16 bit incl. sign
<ul style="list-style-type: none"> Input resistance (-50 mV to +50 mV) 	10 MΩ
<ul style="list-style-type: none"> -80 mV to +80 mV 	Yes; 16 bit incl. sign

• Input resistance (-80 mV to +80 mV)	10 MΩ
Input ranges (rated values), thermocouples	
• Type B	Yes; 16 bit incl. sign
• Input resistance (Type B)	1 MΩ
• Type C	Yes; 16 bit incl. sign
• Input resistance (Type C)	1 MΩ
• Type E	Yes; 16 bit incl. sign
• Input resistance (Type E)	1 MΩ
• Type J	Yes; 16 bit incl. sign
• Input resistance (type J)	1 MΩ
• Type K	Yes; 16 bit incl. sign
• Input resistance (Type K)	1 MΩ
• Type L	Yes; 16 bit incl. sign
• Input resistance (Type L)	1 MΩ
• Type N	Yes; 16 bit incl. sign
• Input resistance (Type N)	1 MΩ
• Type R	Yes; 16 bit incl. sign
• Input resistance (Type R)	1 MΩ
• Type S	Yes; 16 bit incl. sign
• Input resistance (Type S)	1 MΩ
• Type T	Yes; 16 bit incl. sign
• Input resistance (Type T)	1 MΩ
• Type U	Yes; 16 bit incl. sign
• Input resistance (Type U)	1 MΩ
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign
• Input resistance (Type TXK/TXK(L) to GOST)	1 MΩ
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes; 16 bit incl. sign
• Input resistance (Cu 10)	1 MΩ
• Ni 100	Yes; 16 bit incl. sign
• Input resistance (Ni 100)	1 MΩ
• Ni 1000	Yes; 16 bit incl. sign
• Input resistance (Ni 1000)	1 MΩ
• LG-Ni 1000	Yes; 16 bit incl. sign
• Input resistance (LG-Ni 1000)	1 MΩ
• Ni 120	Yes; 16 bit incl. sign
• Input resistance (Ni 120)	1 MΩ
• Ni 200	Yes; 16 bit incl. sign
• Input resistance (Ni 200)	1 MΩ
• Ni 500	Yes; 16 bit incl. sign
• Input resistance (Ni 500)	1 MΩ

• Pt 100	Yes; 16 bit incl. sign
• Input resistance (Pt 100)	1 MΩ
• Pt 1000	Yes; 16 bit incl. sign
• Input resistance (Pt 1000)	1 MΩ
• Pt 200	Yes; 16 bit incl. sign
• Input resistance (Pt 200)	1 MΩ
• Pt 500	Yes; 16 bit incl. sign
• Input resistance (Pt 500)	1 MΩ
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes; 15 bit
• Input resistance (0 to 150 ohms)	1 MΩ
• 0 to 300 ohms	Yes; 15 bit
• Input resistance (0 to 300 ohms)	1 MΩ
• 0 to 600 ohms	Yes; 15 bit
• Input resistance (0 to 600 ohms)	1 MΩ
• 0 to 3000 ohms	Yes; 15 bit
• Input resistance (0 to 3000 ohms)	1 MΩ
• 0 to 6000 ohms	Yes; 15 bit
• Input resistance (0 to 6000 ohms)	1 MΩ
• PTC	Yes; 15 bit
• Input resistance (PTC)	1 MΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
— Reference channel of the module	Yes
— internal comparison point	Yes
— Reference channel of the group	Yes
— fixed reference temperature	Yes
Cable length	
• shielded, max.	200 m; 50 m with thermocouples
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.	16 bit
• Integration time, parameterizable	Yes
• Basic conversion time, including integration time (ms)	
— additional processing time for wire-break check	2 ms; In the ranges resistance thermometers, resistors and thermocouples
— additional power line wire-break check	2 ms; for 3/4 wire transducer (resistance thermometer and resistor)

• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz
• Conversion time (per channel)	180 / 60 / 50 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 voltage measurement	Yes
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes
• for resistance measurement with four-wire connection	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.0009 %/K; ±0.005 % / K at thermocouple
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %
• Resistance, relative to input range, (+/-)	0.05 %
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.	70 dB
• Common mode voltage, max.	10 V
• Common mode interference, min.	90 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Monitoring the supply voltage	Yes

• Wire-break	Yes
• Overflow/underflow	Yes
Diagnostics indication 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; Green/red LED
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
Permissible potential difference	
between different circuits	75 V DC/60 V AC
between the inputs (UCM)	10 V DC
Isolation	
Isolation tested with	707 V DC
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin; Startup @ -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.	3 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K at 795 hPa ... 701 hPa (+2 000 m ... +3 000 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 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; *
from supply voltage 1L+	
— Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Dimensions	
Width	71.5 mm
Height	90 mm
Depth	60 mm

Weights	
Weight, approx.	30 g
last modified:	05/17/2018