



SIMATIC ET 200SP, Analog input module, AI 8xRTD/TC 2-wire High Feature suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.1%

General information	
Product type designation	AI 8xRTD/TC 2-wire HF
HW functional status	From FS05
Firmware version	V2.1
<ul style="list-style-type: none"> FW update possible 	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC00
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	No
<ul style="list-style-type: none"> Measuring range scalable 	Yes
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V16, V17 / V18
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.5 SP3 / V5.5 SP4
<ul style="list-style-type: none"> PCS 7 configurable/integrated from version 	V8.1 SP1
<ul style="list-style-type: none"> PROFIBUS from GSD version/GSD revision 	One GSD file each, Revision 3 and 5 and higher
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	GSDML V2.35
Operating mode	
<ul style="list-style-type: none"> Oversampling 	No
<ul style="list-style-type: none"> MSI 	No
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.	35 mA
Power loss	
Power loss, typ.	0.75 W
Address area	
Address space per module	
<ul style="list-style-type: none"> Address space per module, max. 	16 byte; + 1 byte for QI information
Hardware configuration	
Automatic encoding	
<ul style="list-style-type: none"> Mechanical coding element 	Yes

• Type of mechanical coding element	Type A
Selection of BaseUnit for connection variants	
• 2-wire connection	BU type A0, A1
Analog inputs	
Number of analog inputs	8
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)
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• -1 V to +1 V — Input resistance (-1 V to +1 V)	Yes; 16 bit incl. sign 1 MΩ
• -250 mV to +250 mV — Input resistance (-250 mV to +250 mV)	Yes; 16 bit incl. sign 1 MΩ
• -50 mV to +50 mV — Input resistance (-50 mV to +50 mV)	Yes; 16 bit incl. sign 1 MΩ
• -80 mV to +80 mV — Input resistance (-80 mV to +80 mV)	Yes; 16 bit incl. sign 1 MΩ
Input ranges (rated values), thermocouples	
• Type B — Input resistance (Type B)	Yes; 16 bit incl. sign 1 MΩ
• Type C — Input resistance (Type C)	Yes; 16 bit incl. sign 1 MΩ
• Type E — Input resistance (Type E)	Yes; 16 bit incl. sign 1 MΩ
• Type J — Input resistance (type J)	Yes; 16 bit incl. sign 1 MΩ
• Type K — Input resistance (Type K)	Yes; 16 bit incl. sign 1 MΩ
• Type L — Input resistance (Type L)	Yes; 16 bit incl. sign 1 MΩ
• Type N — Input resistance (Type N)	Yes; 16 bit incl. sign 1 MΩ
• Type R — Input resistance (Type R)	Yes; 16 bit incl. sign 1 MΩ
• Type S — Input resistance (Type S)	Yes; 16 bit incl. sign 1 MΩ
• Type T — Input resistance (Type T)	Yes; 16 bit incl. sign 1 MΩ
• Type U — Input resistance (Type U)	Yes; 16 bit incl. sign 1 MΩ
• Type TXK/TXK(L) to GOST — Input resistance (Type TXK/TXK(L) to GOST)	Yes; 16 bit incl. sign 1 MΩ
Input ranges (rated values), resistance thermometer	
• Ni 100 — Input resistance (Ni 100)	Yes; 16 bit incl. sign 1 MΩ
• Ni 1000 — Input resistance (Ni 1000)	Yes; 16 bit incl. sign 1 MΩ
• LG-Ni 1000 — Input resistance (LG-Ni 1000)	Yes; 16 bit incl. sign 1 MΩ
• Ni 120 — Input resistance (Ni 120)	Yes; 16 bit incl. sign 1 MΩ
• Ni 200 — Input resistance (Ni 200)	Yes; 16 bit incl. sign 1 MΩ
• Ni 500 — Input resistance (Ni 500)	Yes; 16 bit incl. sign 1 MΩ
• Pt 100 — Input resistance (Pt 100)	Yes; 16 bit incl. sign 1 MΩ

<ul style="list-style-type: none"> ● Pt 1000 <ul style="list-style-type: none"> — Input resistance (Pt 1000) ● Pt 200 <ul style="list-style-type: none"> — Input resistance (Pt 200) ● Pt 500 <ul style="list-style-type: none"> — Input resistance (Pt 500) 	<p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p>
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> ● 0 to 150 ohms <ul style="list-style-type: none"> — Input resistance (0 to 150 ohms) ● 0 to 300 ohms <ul style="list-style-type: none"> — Input resistance (0 to 300 ohms) ● 0 to 600 ohms <ul style="list-style-type: none"> — Input resistance (0 to 600 ohms) ● 0 to 3000 ohms <ul style="list-style-type: none"> — Input resistance (0 to 3000 ohms) ● 0 to 6000 ohms <ul style="list-style-type: none"> — Input resistance (0 to 6000 ohms) ● PTC <ul style="list-style-type: none"> — Input resistance (PTC) 	<p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p>
Thermocouple (TC)	
Temperature compensation	
<ul style="list-style-type: none"> — parameterizable — Reference channel of the module — internal comparison point — Reference channel of the group — Number of reference channel groups — fixed reference temperature 	<p>Yes</p> <p>Yes</p> <p>Yes; with BaseUnit type A1</p> <p>Yes</p> <p>4; Group 0 to 3</p> <p>Yes</p>
Cable length	
<ul style="list-style-type: none"> ● 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	
<ul style="list-style-type: none"> ● Resolution with overrange (bit including sign), max. ● Integration time, parameterizable ● Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> — additional processing time for wire-break check ● Interference voltage suppression for interference frequency f1 in Hz ● Conversion time (per channel) 	<p>16 bit</p> <p>Yes</p> <p>2 ms; In the ranges resistance thermometers, resistors and thermocouples</p> <p>16.6 / 50 / 60 Hz</p> <p>180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms</p>
Smoothing of measured values	
<ul style="list-style-type: none"> ● Number of smoothing levels ● parameterizable 	<p>4; None; 4/8/16 times</p> <p>Yes</p>
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> ● for voltage measurement ● for resistance measurement with two-wire connection ● for resistance measurement with three-wire connection ● for resistance measurement with four-wire connection 	<p>Yes</p> <p>Yes</p> <p>No</p> <p>No</p>
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	
<ul style="list-style-type: none"> ● Voltage, relative to input range, (+/-) 	0.1 %

<ul style="list-style-type: none"> Resistance, relative to input range, (+/-) 	0.1 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) 	0.05 %
<ul style="list-style-type: none"> Resistance, relative to input range, (+/-) 	0.05 %
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. 	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB
<ul style="list-style-type: none"> Common mode voltage, max. 	10 V
<ul style="list-style-type: none"> Common mode interference, min. 	90 dB
Interrupts/diagnostics/status information	
Alarms	
<ul style="list-style-type: none"> Diagnostic alarm 	Yes
<ul style="list-style-type: none"> Limit value alarm 	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; channel by channel
<ul style="list-style-type: none"> Group error 	Yes
<ul style="list-style-type: none"> Overflow/underflow 	Yes; channel by channel
Diagnostics indication LED	
<ul style="list-style-type: none"> Monitoring of the supply voltage (PWR-LED) 	Yes; green PWR 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; green/red DIAG 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 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)	10 V DC
Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> horizontal installation, min. 	-30 °C
<ul style="list-style-type: none"> horizontal installation, max. 	60 °C
<ul style="list-style-type: none"> vertical installation, min. 	-30 °C
<ul style="list-style-type: none"> vertical installation, max. 	50 °C
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> Installation altitude above sea level, max. 	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
last modified:	12/28/2021 