

SIMATIC ET 200SP, Analog input module, AI 4xRTD/TC High Feature, suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.1%, 2-/3-/4-wire



General information	
HW functional status	From FS08
Firmware version	
<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"> Adjustment of measuring range 	Yes
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated as of version 	V14
<ul style="list-style-type: none"> STEP 7 configurable/integrated as of version 	V5.6
<ul style="list-style-type: none"> PCS 7 configurable/integrated as of version 	V8.1 SP1
<ul style="list-style-type: none"> PROFIBUS as of GSD version/GSD revision 	One GSD file each, Revision 3 and 5 and higher
<ul style="list-style-type: none"> PROFINET as of GSD version/GSD revision 	GSDML V2.3
Operating mode	
<ul style="list-style-type: none"> Oversampling 	No

- 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
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Power loss

Power loss, typ.	0.75 W
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Address area

Address space per module	
<ul style="list-style-type: none"> • Address space per module, max. 	8 byte; + 1 byte for QI information

Hardware configuration

Automatic encoding	Yes
<ul style="list-style-type: none"> • Mechanical coding element 	Yes
Selection of BaseUnit for connection variants	
<ul style="list-style-type: none"> • 2-wire connection 	BU type A0, A1
<ul style="list-style-type: none"> • 3-wire connection 	BU type A0, A1

Analog inputs

Number of analog inputs	4
permissible input voltage for voltage input (destruction limit), max.	30 V
Constant measurement current for resistance-type transmitter, typ.	0.7 mA; 1.7 mA for Cu10 sensors
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) 	1 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) 	1 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) 	1 MΩ

• -80 mV to +80 mV	Yes; 16 bit incl. sign
• Input resistance (-80 mV to +80 mV)	1 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; with BaseUnit type A1
— Reference channel of the group	Yes
— Number of reference channel groups	4; Group 0 to 3
— 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	
• Number of smoothing levels	4; None; 4/8/16 times
• parameterizable	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 $f = n \times (f1 \pm 1 \%)$, f1 = 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

Isochronous mode

Isochronous operation (application synchronized up to terminal)	No
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Interrupts/diagnostics/status information

Diagnostics function	Yes
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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; channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; Green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG 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 the inputs (UCM)	10 V DC
Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
last modified:	08/24/2019