



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   |
| • FW update possible                                      | Yes  |
| usable BaseUnits  | BU type A0, A1                                 |
| Color code for module-specific color identification plate | CC00   |
| Product function  |  |
| • I&M data  | Yes; I&M0 to I&M3                              |
| • Isochronous mode  | No   |
| • Measuring range scalable                                | Yes  |
| Engineering with  |  |
| • STEP 7 TIA Portal configurable/integrated from version  | V16, V17 / V18                                 |
| • STEP 7 configurable/integrated from version             | V5.5 SP3 / V5.5 SP4                            |
| • PCS 7 configurable/integrated from version              | V8.1 SP1                                       |
| • PROFIBUS from GSD version/GSD revision                  | One GSD file each, Revision 3 and 5 and higher |
| • PROFINET from GSD version/GSD revision                  | GSDML V2.35                                    |
| Operating mode  |  |
| • 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  |
| Power loss  |  |
| Power loss, typ.  | 0.75 W   |
| Address area  |  |
| Address space per module                                  |  |
| • Address space per module, max.                          | 16 byte; + 1 byte for QI information           |
| Hardware configuration                                    |  |
| Automatic encoding  |  |
| • 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<br>— Input resistance (-1 V to +1 V)             | Yes; 16 bit incl. sign<br>1 MΩ |
| • -250 mV to +250 mV<br>— Input resistance (-250 mV to +250 mV) | Yes; 16 bit incl. sign<br>1 MΩ |
| • -50 mV to +50 mV<br>— Input resistance (-50 mV to +50 mV)     | Yes; 16 bit incl. sign<br>1 MΩ |
| • -80 mV to +80 mV<br>— Input resistance (-80 mV to +80 mV)     | Yes; 16 bit incl. sign<br>1 MΩ |

| Input ranges (rated values), thermocouples                                |                                |
|---|--------------------------------|
| • Type B<br>— Input resistance (Type B)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type C<br>— Input resistance (Type C)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type E<br>— Input resistance (Type E)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type J<br>— Input resistance (type J)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type K<br>— Input resistance (Type K)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type L<br>— Input resistance (Type L)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type N<br>— Input resistance (Type N)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type R<br>— Input resistance (Type R)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type S<br>— Input resistance (Type S)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type T<br>— Input resistance (Type T)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type U<br>— Input resistance (Type U)                                   | Yes; 16 bit incl. sign<br>1 MΩ |
| • Type TXK/TXK(L) to GOST<br>— Input resistance (Type TXK/TXK(L) to GOST) | Yes; 16 bit incl. sign<br>1 MΩ |

| Input ranges (rated values), resistance thermometer |                                |
|---|--------------------------------|
| • Ni 100<br>— Input resistance (Ni 100)             | Yes; 16 bit incl. sign<br>1 MΩ |
| • Ni 1000<br>— Input resistance (Ni 1000)           | Yes; 16 bit incl. sign<br>1 MΩ |
| • LG-Ni 1000<br>— Input resistance (LG-Ni 1000)     | Yes; 16 bit incl. sign<br>1 MΩ |
| • Ni 120<br>— Input resistance (Ni 120)             | Yes; 16 bit incl. sign<br>1 MΩ |
| • Ni 200<br>— Input resistance (Ni 200)             | Yes; 16 bit incl. sign<br>1 MΩ |
| • Ni 500<br>— Input resistance (Ni 500)             | Yes; 16 bit incl. sign<br>1 MΩ |
| • Pt 100<br>— Input resistance (Pt 100)             | Yes; 16 bit incl. sign<br>1 MΩ |
| • Pt 1000<br>— Input resistance (Pt 1000)           | Yes; 16 bit incl. sign<br>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   |
| <b>Input ranges (rated values), resistors</b>   |  |
| • 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   |
| <b>Thermocouple (TC)</b>  |  |
| <b>Temperature compensation</b>   |  |
| — 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  |
| <b>Cable length</b>   |  |
| • shielded, max.  | 200 m; 50 m with thermocouples   |
| <b>Analog value generation for the inputs</b>   |  |
| Measurement principle   | integrating (Sigma-Delta)  |
| <b>Integration and conversion time/resolution per channel</b>   |  |
| • 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 |
| • Interference voltage suppression for interference frequency f1 in Hz  | 16.6 / 50 / 60 Hz  |
| • Conversion time (per channel)   | 180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms                                 |
| <b>Smoothing of measured values</b>   |  |
| • Number of smoothing levels  | 4; None; 4/8/16 times  |
| • parameterizable   | Yes  |
| <b>Encoder</b>  |  |
| <b>Connection of signal encoders</b>  |  |
| • for voltage measurement   | Yes  |
| • for resistance measurement with two-wire connection   | Yes  |
| • for resistance measurement with three-wire connection   | No   |
| • for resistance measurement with four-wire connection  | No   |
| <b>Errors/accuracies</b>  |  |
| 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 %   |
| <b>Operational error limit in overall temperature range</b>   |  |
| • Voltage, relative to input range, (+/-)   | 0.1 %  |
| • Resistance, relative to input range, (+/-)  | 0.1 %  |
| <b>Basic error limit (operational limit at 25 °C)</b>   |  |
| • Voltage, relative to input range, (+/-)   | 0.05 %   |
| • Resistance, relative to input range, (+/-)  | 0.05 %   |
| <b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b> |  |
| • 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                |
| • common mode voltage / with interference voltage suppression / maximum   | 10 V   |

|  |   |
|--|---|
| • Common mode interference, min.                               | 90 dB   |
| <b>Interrupts/diagnostics/status information</b>               |   |
| <b>Alarms</b>  |   |
| • Diagnostic alarm   | Yes   |
| • Limit value alarm  | Yes; two upper and two lower limit values in each case  |
| <b>Diagnoses</b>   |   |
| • Monitoring the supply voltage                                | Yes   |
| • Wire-break   | Yes; channel by channel   |
| • Group error  | Yes   |
| • Overflow/underflow   | Yes; channel by channel   |
| <b>Diagnostics indication LED</b>                              |   |
| • 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   |
| <b>Potential separation</b>                                    |   |
| <b>Potential separation channels</b>                           |   |
| • between the channels   | No  |
| • between the channels and backplane bus                       | Yes   |
| • between the channels and the power supply of the electronics | Yes   |
| <b>Permissible potential difference</b>                        |   |
| between the inputs (UCM)                                       | 10 V DC   |
| <b>Isolation</b>   |   |
| Isolation tested with  | 707 V DC (type test)  |
| <b>Ambient conditions</b>                                      |   |
| <b>Ambient temperature during operation</b>                    |   |
| • horizontal installation, min.                                | -30 °C  |
| • horizontal installation, max.                                | 60 °C   |
| • vertical installation, min.                                  | -30 °C  |
| • vertical installation, max.                                  | 50 °C   |
| <b>Altitude during operation relating to sea level</b>         |   |
| • Installation altitude above sea level, max.                  | 2 000 m; On request: Installation altitudes greater than 2 000 m                              |
| <b>Dimensions</b>  |   |
| Width  | 15 mm   |
| Height   | 73 mm   |
| Depth  | 58 mm   |
| <b>last modified:</b>  | 4/25/2024  |