




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, PU 1                    |
| HW functional status                                      | From FS05                                      |
| Firmware version  |  |
| • 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  | V14 / -  |
| • PROFIBUS from GSD version/GSD revision                  | One GSD file each, Revision 3 and 5 and higher |
| • PROFINET from GSD version/GSD revision                  | GSDML V2.3                                     |
| 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  | Yes  |
| • Mechanical coding element                               | Yes  |

|   |  |
|---|--|
| • Type of mechanical coding element                                       | Type A   |
| <b>Selection of BaseUnit for connection variants</b>                      |  |
| • 2-wire connection   | BU type A0, A1   |
| <b>Analog inputs</b>  |  |
| 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   |
| <b>Input ranges (rated values), voltages</b>                              |  |
| • -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   |
| <b>Input ranges (rated values), thermocouples</b>                         |  |
| • 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   |
| <b>Input ranges (rated values), resistance thermometer</b>                |  |
| • 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   |

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|--|---|
| <ul style="list-style-type: none"> <li>● Pt 100 <ul style="list-style-type: none"> <li>— Input resistance (Pt 100)</li> </ul> </li> <li>● Pt 1000 <ul style="list-style-type: none"> <li>— Input resistance (Pt 1000)</li> </ul> </li> <li>● Pt 200 <ul style="list-style-type: none"> <li>— Input resistance (Pt 200)</li> </ul> </li> <li>● Pt 500 <ul style="list-style-type: none"> <li>— Input resistance (Pt 500)</li> </ul> </li> </ul>   | <p>Yes; 16 bit incl. sign<br/>1 M<math>\Omega</math></p> <p>Yes; 16 bit incl. sign<br/>1 M<math>\Omega</math></p> <p>Yes; 16 bit incl. sign<br/>1 M<math>\Omega</math></p> <p>Yes; 16 bit incl. sign<br/>1 M<math>\Omega</math></p>   |
| <b>Input ranges (rated values), resistors</b>  |   |
| <ul style="list-style-type: none"> <li>● 0 to 150 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 150 ohms)</li> </ul> </li> <li>● 0 to 300 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 300 ohms)</li> </ul> </li> <li>● 0 to 600 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 600 ohms)</li> </ul> </li> <li>● 0 to 3000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 3000 ohms)</li> </ul> </li> <li>● 0 to 6000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 6000 ohms)</li> </ul> </li> <li>● PTC <ul style="list-style-type: none"> <li>— Input resistance (PTC)</li> </ul> </li> </ul> | <p>Yes; 15 bit<br/>1 M<math>\Omega</math></p> <p>Yes; 15 bit<br/>1 M<math>\Omega</math></p> <p>Yes; 15 bit<br/>1 M<math>\Omega</math></p> <p>Yes; 15 bit<br/>1 M<math>\Omega</math></p> <p>Yes; 15 bit<br/>1 M<math>\Omega</math></p> <p>Yes<br/>1 M<math>\Omega</math></p> |
| <b>Thermocouple (TC)</b>   |   |
| <b>Temperature compensation</b>  |   |
| <ul style="list-style-type: none"> <li>— parameterizable</li> <li>— Reference channel of the module</li> <li>— internal comparison point</li> <li>— Reference channel of the group</li> <li>— Number of reference channel groups</li> <li>— fixed reference temperature</li> </ul>   | <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>  |
| <b>Cable length</b>  |   |
| <ul style="list-style-type: none"> <li>● shielded, max.</li> </ul>   | 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>  |   |
| <ul style="list-style-type: none"> <li>● Resolution with overrange (bit including sign), max.</li> <li>● Integration time, parameterizable</li> <li>● Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> <li>— additional processing time for wire-break check</li> </ul> </li> <li>● Interference voltage suppression for interference frequency f1 in Hz</li> <li>● Conversion time (per channel)</li> </ul>  | <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 ms</p>   |
| <b>Smoothing of measured values</b>  |   |
| <ul style="list-style-type: none"> <li>● Number of smoothing levels</li> <li>● parameterizable</li> </ul>  | <p>4; None; 4/8/16 times</p> <p>Yes</p>   |
| <b>Encoder</b>   |   |
| <b>Connection of signal encoders</b>   |   |
| <ul style="list-style-type: none"> <li>● for voltage measurement</li> <li>● for resistance measurement with two-wire connection</li> <li>● for resistance measurement with three-wire connection</li> <li>● for resistance measurement with four-wire connection</li> </ul>  | <p>Yes</p> <p>Yes</p> <p>No</p> <p>No</p>   |
| <b>Errors/accuracies</b>   |   |
| Linearity error (relative to input range), (+/-)   | 0.01 %; $\pm 0.1$ % for resistance thermometers and resistance  |
| Temperature error (relative to input range), (+/-)   | 0.0009 %/K; $\pm 0.005$ % / 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   |
| • Common mode voltage, max.   | 10 V  |
| • Common mode interference, min.  | 90 dB   |
| <b>Interrupts/diagnostics/status information</b>  |   |
| Diagnostics function  | Yes   |
| <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>   |   |
| 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   |
| <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>   |   |
| Ambient temperature during operation  |   |
| • horizontal installation, min.   | -30 °C; < 0 °C as of FS05   |
| • horizontal installation, max.   | 60 °C   |
| • vertical installation, min.   | -30 °C; < 0 °C as of FS05   |
| • 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                        |
| <b>Dimensions</b>   |   |
| Width   | 15 mm   |
| Height  | 73 mm   |
| Depth   | 58 mm   |
| <b>last modified:</b>   | 1/16/2021  |