




SIMATIC ET 200SP, Analog input module, AI 2x U/I 2-/4-wire High Feat., suitable for BU type A0, A1, Color code CC05, channel diagnostics, 16 bit, +/-0.1%

| General information                                       |  |
|---|--|
| Product type designation                                  | AI 2xU/I 2-/4-wire HF  |
| HW functional status                                      | From FS06  |
| Firmware version  |  |
| • FW update possible                                      | Yes  |
| usable BaseUnits  | BU type A0, A1   |
| Color code for module-specific color identification plate | CC03   |
| Product function  |  |
| • I&M data  | Yes; I&M0 to I&M3  |
| • Isochronous mode  | Yes  |
| • Measuring range scalable                                | No   |
| Engineering with  |  |
| • STEP 7 TIA Portal configurable/integrated from version  | V13  |
| • STEP 7 configurable/integrated from version             | V5.5 / -   |
| • 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 V2.3   |
| Operating mode  |  |
| • Oversampling  | No   |
| • MSI   | Yes  |
| 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 (rated value)                         | 39 mA  |
| Encoder supply  |  |
| 24 V encoder supply                                       |  |
| • 24 V  | Yes  |
| • Short-circuit protection                                | Yes  |
| • Output current, max.                                    | 20 mA; max. 50 mA per channel for a duration < 10 s (two-wire) |
| Additional 24 V encoder supply                            |  |

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Short-circuit protection</li> <li>• Output current, max.</li> </ul>  | Yes; channel by channel<br>100 mA; max. 150 mA for a duration of < 10 s (four-wire)   |
| <b>Power loss</b>   |   |
| Power loss, typ.  | 0.95 W; without sensor supply   |
| <b>Address area</b>   |   |
| Address space per module  |   |
| <ul style="list-style-type: none"> <li>• Address space per module, max.</li> </ul>  | 4 byte; + 4 byte for scaling of measured values, + 1 byte for QI information  |
| <b>Hardware configuration</b>   |   |
| Automatic encoding  | Yes   |
| <ul style="list-style-type: none"> <li>• Mechanical coding element</li> <li>• Type of mechanical coding element</li> </ul>  | Yes<br>Type A   |
| Selection of BaseUnit for connection variants   |   |
| <ul style="list-style-type: none"> <li>• 2-wire connection</li> <li>• 4-wire connection</li> </ul>  | BU type A0, A1<br>BU type A0, A1  |
| <b>Analog inputs</b>  |   |
| Number of analog inputs   | 2; Differential inputs  |
| <ul style="list-style-type: none"> <li>• For current measurement</li> <li>• For voltage measurement</li> </ul>  | 2<br>2  |
| permissible input voltage for voltage input (destruction limit), max.   | 30 V  |
| permissible input current for current input (destruction limit), max.   | 50 mA   |
| Analog input with oversampling  | No  |
| Standardization of measured values  | Yes   |
| Input ranges (rated values), voltages   |   |
| <ul style="list-style-type: none"> <li>• 0 to +10 V               <ul style="list-style-type: none"> <li>— Input resistance (0 to 10 V)</li> </ul> </li> <li>• 1 V to 5 V               <ul style="list-style-type: none"> <li>— Input resistance (1 V to 5 V)</li> </ul> </li> <li>• -10 V to +10 V               <ul style="list-style-type: none"> <li>— Input resistance (-10 V to +10 V)</li> </ul> </li> <li>• -5 V to +5 V               <ul style="list-style-type: none"> <li>— Input resistance (-5 V to +5 V)</li> </ul> </li> </ul> | Yes; 15 bit<br>75 kΩ<br>Yes; 15 bit<br>75 kΩ<br>Yes; 16 bit incl. sign<br>75 kΩ<br>Yes; 16 bit incl. sign<br>75 kΩ  |
| Input ranges (rated values), currents   |   |
| <ul style="list-style-type: none"> <li>• 0 to 20 mA               <ul style="list-style-type: none"> <li>— Input resistance (0 to 20 mA)</li> </ul> </li> <li>• -20 mA to +20 mA               <ul style="list-style-type: none"> <li>— Input resistance (-20 mA to +20 mA)</li> </ul> </li> <li>• 4 mA to 20 mA               <ul style="list-style-type: none"> <li>— Input resistance (4 mA to 20 mA)</li> </ul> </li> </ul>   | Yes; 15 bit<br>130 Ω<br>Yes; 16 bit incl. sign<br>130 Ω<br>Yes; 15 bit<br>130 Ω   |
| Cable length  |   |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>  | 1 000 m; 200 m for voltage measurement  |
| <b>Analog value generation for the inputs</b>   |   |
| Measurement principle   | Sigma Delta   |
| Integration and conversion time/resolution per channel  |   |
| <ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> <li>• Integration time (ms)</li> <li>• Basic conversion time, including integration time (ms)</li> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> <li>• Conversion time (per channel)</li> <li>• Basic execution time of the module (all channels released)</li> </ul>   | 16 bit<br>Yes<br>67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms<br>68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms<br>16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800<br>68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms<br>1 ms |
| Smoothing of measured values  |   |
| <ul style="list-style-type: none"> <li>• Number of smoothing levels</li> <li>• parameterizable</li> </ul>   | 6; none; 2-/4-/8-/16-/32-fold<br>Yes  |

|   |   |
|---|---|
| <b>Encoder</b>  |   |
| Connection of signal encoders   |   |
| • for voltage measurement   | Yes   |
| • for current measurement as 2-wire transducer  | Yes   |
| — Burden of 2-wire transmitter, max.  | 650 Ω   |
| • for current measurement as 4-wire transducer  | Yes   |
| <b>Errors/accuracies</b>  |   |
| Linearity error (relative to input range), (+/-)  | 0.01 %  |
| Temperature error (relative to input range), (+/-)  | 0.003 %/K   |
| Crosstalk between the inputs, min.  | -50 dB  |
| Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)                           | 0.01 %  |
| Operational error limit in overall temperature range  |   |
| • Voltage, relative to input range, (+/-)   | 0.1 %   |
| • Current, relative to input range, (+/-)   | 0.1 %   |
| Basic error limit (operational limit at 25 °C)  |   |
| • Voltage, relative to input range, (+/-)   | 0.05 %; 0.1 % at SFU 4.8 kHz  |
| • Current, relative to input range, (+/-)   | 0.05 %; 0.1 % at SFU 4.8 kHz  |
| Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency |   |
| • Common mode voltage, max.   | 35 V  |
| • Common mode interference, min.  | 90 dB   |
| <b>Isochronous mode</b>   |   |
| Filtering and processing time (TCI), min.   | 800 μs  |
| Bus cycle time (TDP), min.  | 1 ms  |
| Jitter, max.  | 5 μs  |
| <b>Interrupts/diagnostics/status information</b>  |   |
| Diagnostics function  | Yes   |
| Alarms  |   |
| • Diagnostic alarm  | Yes   |
| • Limit value alarm   | Yes; two upper and two lower limit values in each case                      |
| Diagnoses   |   |
| • Monitoring the supply voltage   | Yes   |
| • Wire-break  | Yes; Measuring range 4 to 20 mA only  |
| • Short-circuit   | Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply |
| • Group error   | Yes   |
| • Overflow/underflow  | Yes   |
| 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   |
| <b>Potential separation</b>   |   |
| Potential separation channels   |   |
| • between the channels  | Yes   |
| • between the channels and backplane bus  | Yes   |
| • between the channels and the power supply of the electronics                                      | Yes   |
| <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 FS06   |
| • horizontal installation, max.   | 60 °C   |
| • vertical installation, min.   | -30 °C; < 0 °C as of FS06   |
| • 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   |
| Weights               |   |
| Weight, approx.       | 32 g  |
| <b>last modified:</b> | 1/16/2021  |