



SIMATIC ET 200SP, ANALOG INPUT MODULE, AI 4xI 2-/4-WIRE STANDARD, PACKING UNIT: 10 PIECES, FITS TO BU-TYPE A0, A1, COLOR CODE CC03, MODULE DIAGNOSIS, 16BIT, +/-0,3%

| General information                                       |                                                     |
|-----------------------------------------------------------|-----------------------------------------------------|
| Product type designation                                  | AI 4xI 2-/4-wire ST                                 |
| HW functional status                                      | From FS02                                           |
| 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                                        | No                                                  |
| • Measuring range scalable                                | No                                                  |
| Engineering with                                          |                                                     |
| • STEP 7 TIA Portal configurable/integrated from version  | V14 / -                                             |
| • STEP 7 configurable/integrated from version             | V5.6 and higher                                     |
| • 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                                                     | No                                                  |
| CiR - Configuration in RUN                                |                                                     |
| Reparameterization possible in RUN                        | Yes                                                 |
| Calibration possible in RUN                               | No                                                  |
| 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.                                 | 37 mA; without sensor supply                        |
| 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 |
| Power loss                                                |                                                     |
| Power loss, typ.                                          | 0.85 W; Without encoder supply voltage              |
| Address area                                              |                                                     |
| Address space per module                                  |                                                     |

|                                                                                                                  |                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| • Address space per module, max.                                                                                 | 8 byte; + 1 byte for QI information                                                                                          |
| <b>Hardware configuration</b>                                                                                    |                                                                                                                              |
| 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                                                                                                               |
| • 4-wire connection                                                                                              | BU type A0, A1                                                                                                               |
| <b>Analog inputs</b>                                                                                             |                                                                                                                              |
| Number of analog inputs                                                                                          | 4; Differential inputs                                                                                                       |
| permissible input current for current input (destruction limit), max.                                            | 50 mA                                                                                                                        |
| Cycle time (all channels), min.                                                                                  | Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels) |
| <b>Input ranges (rated values), currents</b>                                                                     |                                                                                                                              |
| • 0 to 20 mA                                                                                                     | Yes; 16 bit incl. sign                                                                                                       |
| — Input resistance (0 to 20 mA)                                                                                  | 100 Ω; + approx. 0.7 V diode forward voltage in 2-wire operation                                                             |
| • -20 mA to +20 mA                                                                                               | Yes                                                                                                                          |
| — Input resistance (-20 mA to +20 mA)                                                                            | 100 Ω                                                                                                                        |
| • 4 mA to 20 mA                                                                                                  | Yes; 15 bit                                                                                                                  |
| — Input resistance (4 mA to 20 mA)                                                                               | 100 Ω; + approx. 0.7 V diode forward voltage in 2-wire operation                                                             |
| <b>Cable length</b>                                                                                              |                                                                                                                              |
| • shielded, max.                                                                                                 | 1 000 m                                                                                                                      |
| <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                                                                                                                          |
| • Interference voltage suppression for interference frequency f1 in Hz                                           | 16.6 / 50 / 60 Hz                                                                                                            |
| • Conversion time (per channel)                                                                                  | 180 / 60 / 50 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                                                                                        | No                                                                                                                           |
| • 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), (+/-)                                                               | 0.005 %/K                                                                                                                    |
| Crosstalk between the inputs, min.                                                                               | 50 dB; Applies to up to ±5 V overvoltage in other channels                                                                   |
| Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)                                        | 0.05 %                                                                                                                       |
| <b>Operational error limit in overall temperature range</b>                                                      |                                                                                                                              |
| • Current, relative to input range, (+/-)                                                                        | 0.5 %                                                                                                                        |
| <b>Basic error limit (operational limit at 25 °C)</b>                                                            |                                                                                                                              |
| • Current, relative to input range, (+/-)                                                                        | 0.3 %                                                                                                                        |
| <b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = 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                                                                                              | No                                                                                                                           |

|                                                                                                              |        |                                                                                                      |                |
|--------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------|----------------|
| Diagnoses                                                                                                    |        |                                                                                                      |                |
| <ul style="list-style-type: none"><li>Monitoring the supply voltage</li></ul>                                |        | Yes                                                                                                  |                |
| <ul style="list-style-type: none"><li>Wire-break</li></ul>                                                   |        | Yes; at 4 to 20 mA                                                                                   |                |
| <ul style="list-style-type: none"><li>Short-circuit</li></ul>                                                |        | Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply |                |
| <ul style="list-style-type: none"><li>Group error</li></ul>                                                  |        | Yes                                                                                                  |                |
| <ul style="list-style-type: none"><li>Overflow/underflow</li></ul>                                           |        | Yes                                                                                                  |                |
| Diagnostics indication LED                                                                                   |        |                                                                                                      |                |
| <ul style="list-style-type: none"><li>Monitoring of the supply voltage (PWR-LED)</li></ul>                   |        | Yes; green LED                                                                                       |                |
| <ul style="list-style-type: none"><li>Channel status display</li></ul>                                       |        | Yes; green LED                                                                                       |                |
| <ul style="list-style-type: none"><li>for channel diagnostics</li></ul>                                      |        | No                                                                                                   |                |
| <ul style="list-style-type: none"><li>for module diagnostics</li></ul>                                       |        | Yes; green/red LED                                                                                   |                |
| Potential separation                                                                                         |        |                                                                                                      |                |
| Potential separation channels                                                                                |        |                                                                                                      |                |
| <ul style="list-style-type: none"><li>between the channels</li></ul>                                         |        | Yes; channel group-specific between 2-wire current input group and 4-wire voltage input group        |                |
| <ul style="list-style-type: none"><li>between the channels and backplane bus</li></ul>                       |        | Yes                                                                                                  |                |
| <ul style="list-style-type: none"><li>between the channels and the power supply of the electronics</li></ul> |        | Yes; only for 4-wire transducer                                                                      |                |
| Permissible potential difference                                                                             |        |                                                                                                      |                |
| between the inputs (UCM)                                                                                     |        | 10 V DC                                                                                              |                |
| Isolation                                                                                                    |        |                                                                                                      |                |
| Isolation tested with                                                                                        |        | 707 V DC (type test)                                                                                 |                |
| Standards, approvals, certificates                                                                           |        |                                                                                                      |                |
| Ecological footprint                                                                                         |        |                                                                                                      |                |
| <ul style="list-style-type: none"><li>environmental product declaration</li></ul>                            |        | Yes                                                                                                  |                |
| Global warming potential                                                                                     |        |                                                                                                      |                |
| — global warming potential, (total) [CO2 eq]                                                                 |        | 9.32 kg                                                                                              |                |
| — global warming potential, (during production) [CO2 eq]                                                     |        | 4.97 kg                                                                                              |                |
| — global warming potential, (during operation) [CO2 eq]                                                      |        | 4.79 kg                                                                                              |                |
| — global warming potential, (after end of life cycle) [CO2 eq]                                               |        | -0.449 kg                                                                                            |                |
| Ambient conditions                                                                                           |        |                                                                                                      |                |
| Ambient temperature during operation                                                                         |        |                                                                                                      |                |
| <ul style="list-style-type: none"><li>horizontal installation, min.</li></ul>                                |        | -30 °C; < 0 °C as of FS02                                                                            |                |
| <ul style="list-style-type: none"><li>horizontal installation, max.</li></ul>                                |        | 60 °C                                                                                                |                |
| <ul style="list-style-type: none"><li>vertical installation, min.</li></ul>                                  |        | -30 °C; < 0 °C as of FS02                                                                            |                |
| <ul style="list-style-type: none"><li>vertical installation, max.</li></ul>                                  |        | 50 °C                                                                                                |                |
| Altitude during operation relating to sea level                                                              |        |                                                                                                      |                |
| <ul style="list-style-type: none"><li>Installation altitude above sea level, max.</li></ul>                  |        | 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.                                                                                              |        | 31 g                                                                                                 |                |
| Classifications                                                                                              |        |                                                                                                      |                |
|                                                                                                              |        | Version                                                                                              | Classification |
|                                                                                                              | eClass | 14                                                                                                   | 27-24-26-01    |
|                                                                                                              | eClass | 12                                                                                                   | 27-24-26-01    |
|                                                                                                              | eClass | 9.1                                                                                                  | 27-24-26-01    |
|                                                                                                              | eClass | 9                                                                                                    | 27-24-26-01    |
|                                                                                                              | eClass | 8                                                                                                    | 27-24-26-01    |
|                                                                                                              | eClass | 7.1                                                                                                  | 27-24-26-01    |
|                                                                                                              | eClass | 6                                                                                                    | 27-24-26-01    |
|                                                                                                              | ETIM   | 10                                                                                                   | EC001596       |

|        |    |             |
|--------|----|-------------|
| ETIM   | 9  | EC001596    |
| ETIM   | 8  | EC001596    |
| ETIM   | 7  | EC001596    |
| IDEA   | 4  | 3562        |
| UNSPSC | 15 | 32-15-17-05 |

Approvals / Certificates

General Product Approval

[Miscellaneous](#)



[Manufacturer Declaration](#)

[China RoHS](#)

[Metrological Approval](#)

|                          |                      |             |
|--------------------------|----------------------|-------------|
| General Product Approval | Maritime application | Environment |
|--------------------------|----------------------|-------------|



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