

SIMATIC S7-1200, ANALOG INPUT, SM 1231, 4 AI, +/-10V, +/-5V, +/-2.5V, +/-1.25 OR 0-20mA/4-20 mA, 15 BIT + SIGN BIT



| Supply voltage                                                        |                                                         |
|-----------------------------------------------------------------------|---------------------------------------------------------|
| Rated value (DC)                                                      |                                                         |
| • 24 V DC                                                             | Yes                                                     |
| Input current                                                         |                                                         |
| Current consumption, typ.                                             | 65 mA                                                   |
| from backplane bus 5 V DC, typ.                                       | 80 mA                                                   |
| Power loss                                                            |                                                         |
| Power loss, typ.                                                      | 1.8 W                                                   |
| Analog inputs                                                         |                                                         |
| Number of analog inputs                                               | 4; Current or voltage differential inputs               |
| permissible input voltage for current input (destruction limit), max. | $\pm 35$ V                                              |
| permissible input voltage for voltage input (destruction limit), max. | 35 V                                                    |
| permissible input current for voltage input (destruction limit), max. | 40 mA                                                   |
| permissible input current for current input (destruction limit), max. | 40 mA                                                   |
| Cycle time (all channels) max.                                        | 625 $\mu$ s                                             |
| Input ranges                                                          |                                                         |
| • Voltage                                                             | Yes; $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V or $\pm 1.25$ V |
| • Current                                                             | Yes; 4 to 20 mA, 0 to 20 mA                             |
| • Thermocouple                                                        | No                                                      |
| • Resistance thermometer                                              | No                                                      |

|                                                                                                |                                                         |
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| • Resistance                                                                                   | Yes                                                     |
| Input ranges (rated values), voltages                                                          |                                                         |
| • -1.25 V to +1.25 V                                                                           | Yes                                                     |
| • -10 V to +10 V                                                                               | Yes                                                     |
| • Input resistance (-10 V to +10 V)                                                            | ≥9 MOhm                                                 |
| • -2.5 V to +2.5 V                                                                             | Yes                                                     |
| • Input resistance (-2.5 V to +2.5 V)                                                          | ≥9 MOhm                                                 |
| • -5 V to +5 V                                                                                 | Yes                                                     |
| • Input resistance (-5 V to +5 V)                                                              | ≥9 MOhm                                                 |
| Input ranges (rated values), currents                                                          |                                                         |
| • 0 to 20 mA                                                                                   | Yes                                                     |
| • 4 mA to 20 mA                                                                                | Yes                                                     |
| Analog outputs                                                                                 |                                                         |
| Number of analog outputs                                                                       | 0                                                       |
| Analog value generation                                                                        |                                                         |
| Integration and conversion time/resolution per channel                                         |                                                         |
| • Resolution with overrange (bit including sign), max.                                         | 15 bit; + sign                                          |
| • Integration time, parameterizable                                                            | Yes                                                     |
| • Interference voltage suppression for interference frequency f1 in Hz                         | 40 dB, DC to 60 V for interference frequency 50 / 60 Hz |
| Smoothing of measured values                                                                   |                                                         |
| • Parameterizable                                                                              | Yes                                                     |
| • Step: None                                                                                   | Yes                                                     |
| • Step: low                                                                                    | Yes                                                     |
| • Step: Medium                                                                                 | Yes                                                     |
| • Step: High                                                                                   | Yes                                                     |
| Errors/accuracies                                                                              |                                                         |
| Temperature error (relative to input range), (+/-)                                             | 25 °C ±0.1% / ±0.3% total measurement range             |
| Basic error limit (operational limit at 25 °C)                                                 |                                                         |
| • Voltage, relative to input area, (+/-)                                                       | 0.1 %                                                   |
| • Current, relative to input area, (+/-)                                                       | 0.1 %                                                   |
| Interference voltage suppression for $f = n \times (f1 \pm 1\%)$ , f1 = interference frequency |                                                         |
| • Common mode voltage, max.                                                                    | 12 V                                                    |
| Interrupts/diagnostics/status information                                                      |                                                         |
| Alarms                                                                                         |                                                         |
| • Alarms                                                                                       | Yes                                                     |
| • Diagnostic alarm                                                                             | Yes                                                     |
| Diagnostic messages                                                                            |                                                         |
| • Diagnostic functions                                                                         | Yes                                                     |

|                                                                |                                                                                                       |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| • Monitoring the supply voltage                                | Yes                                                                                                   |
| • Wire-break                                                   | Yes                                                                                                   |
| Diagnostics indication LED                                     |                                                                                                       |
| • for status of the inputs                                     | Yes                                                                                                   |
| • for maintenance                                              | Yes                                                                                                   |
| Potential separation analog outputs                            |                                                                                                       |
| • between the channels and the power supply of the electronics | No                                                                                                    |
| Degree and class of protection                                 |                                                                                                       |
| Degree of protection acc. to EN 60529                          |                                                                                                       |
| • IP20                                                         | Yes                                                                                                   |
| Standards, approvals, certificates                             |                                                                                                       |
| CE mark                                                        | Yes                                                                                                   |
| CSA approval                                                   | Yes                                                                                                   |
| FM approval                                                    | Yes                                                                                                   |
| RCM (formerly C-TICK)                                          | Yes                                                                                                   |
| Marine approval                                                |                                                                                                       |
| • Marine approval                                              | Yes                                                                                                   |
| Highest safety class achievable in safety mode                 |                                                                                                       |
| • SIL acc. to IEC 61508                                        | none                                                                                                  |
| Ambient conditions                                             |                                                                                                       |
| Free fall                                                      |                                                                                                       |
| • Drop height, max. (in packaging)                             | 0.3 m; five times, in dispatch package                                                                |
| Ambient temperature during operation                           |                                                                                                       |
| • permissible temperature range                                | -20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing |
| • min.                                                         | -20 °C                                                                                                |
| • max.                                                         | 60 °C                                                                                                 |
| Ambient temperature during storage/transportation              |                                                                                                       |
| • min.                                                         | -40 °C                                                                                                |
| • max.                                                         | 70 °C                                                                                                 |
| Air pressure acc. to IEC 60068-2-13                            |                                                                                                       |
| • Operation, min.                                              | 795 hPa                                                                                               |
| • Operation, max.                                              | 1 080 hPa                                                                                             |
| • Storage/transport, min.                                      | 660 hPa                                                                                               |
| • Storage/transport, max.                                      | 1 080 hPa                                                                                             |
| Relative humidity                                              |                                                                                                       |
| • permissible range (without condensation) at 25 °C            | 95 %                                                                                                  |
| Pollutant concentrations                                       |                                                                                                       |
| — SO2 at RH < 60% without condensation                         | SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free                                            |

| Connection method        |            |
|--------------------------|------------|
| required front connector | Yes        |
| Mechanics/material       |            |
| Type of housing (front)  |            |
| • plastic                | Yes        |
| Dimensions               |            |
| Width                    | 45 mm      |
| Height                   | 100 mm     |
| Depth                    | 75 mm      |
| Weights                  |            |
| Weight, approx.          | 180 g      |
| <b>last modified:</b>    | 03.06.2015 |