

SIMATIC S7-1200, Analog input, SM 1231 TC, 8 AI thermocouples



### General information

|                          |                         |
|--------------------------|-------------------------|
| Product type designation | SM 1231, AI 8x16 bit TC |
|--------------------------|-------------------------|

### Supply voltage

|                  |     |
|------------------|-----|
| Rated value (DC) |     |
| • 24 V DC        | Yes |

### Input current

|                                 |       |
|---------------------------------|-------|
| Current consumption, typ.       | 40 mA |
| from backplane bus 5 V DC, typ. | 80 mA |

### Power loss

|                  |       |
|------------------|-------|
| Power loss, typ. | 1.5 W |
|------------------|-------|

### Analog inputs

|                                                                       |                                    |
|-----------------------------------------------------------------------|------------------------------------|
| Number of analog inputs                                               | 8; Thermocouples                   |
| permissible input voltage for voltage input (destruction limit), max. | ±35 V                              |
| Technical unit for temperature measurement adjustable                 | Degrees Celsius/degrees Fahrenheit |

### Input ranges

|           |     |
|-----------|-----|
| • Voltage | Yes |
|-----------|-----|

|                                                                                                 |                                                                        |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| • Current                                                                                       | No                                                                     |
| • Thermocouple                                                                                  | Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: $\pm 80$ mV |
| • Resistance thermometer                                                                        | No                                                                     |
| • Resistance                                                                                    | No                                                                     |
| Input ranges (rated values), voltages                                                           |                                                                        |
| • -80 mV to +80 mV                                                                              | Yes                                                                    |
| • Input resistance (-80 mV to +80 mV)                                                           | $\geq 1$ MOhm                                                          |
| Input ranges (rated values), thermocouples                                                      |                                                                        |
| • Type B                                                                                        | Yes                                                                    |
| • Type C                                                                                        | Yes                                                                    |
| • Type E                                                                                        | Yes                                                                    |
| • Type J                                                                                        | Yes                                                                    |
| • Type K                                                                                        | Yes                                                                    |
| • Type N                                                                                        | Yes                                                                    |
| • Type R                                                                                        | Yes                                                                    |
| • Type S                                                                                        | Yes                                                                    |
| • Type T                                                                                        | Yes                                                                    |
| • Type TXK/TXK(L) to GOST                                                                       | Yes                                                                    |
| Thermocouple (TC)                                                                               |                                                                        |
| Temperature compensation                                                                        |                                                                        |
| — parameterizable                                                                               | No                                                                     |
| Analog value generation for the inputs                                                          |                                                                        |
| Measurement principle                                                                           | integrating                                                            |
| Integration and conversion time/resolution per channel                                          |                                                                        |
| • Resolution with overrange (bit including sign), max.                                          | 15 bit; + sign                                                         |
| • Integration time, parameterizable                                                             | No                                                                     |
| • Interference voltage suppression for interference frequency f1 in Hz                          | 85 dB at 50 / 60 / 400 Hz                                              |
| Smoothing of measured values                                                                    |                                                                        |
| • parameterizable                                                                               | Yes                                                                    |
| Errors/accuracies                                                                               |                                                                        |
| Temperature error (relative to input range), (+/-)                                              | 25 °C $\pm 0.1\%$ , to 55 °C $\pm 0.2\%$ total measurement range       |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)                      | 0.5 %                                                                  |
| Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , f1 = interference frequency |                                                                        |
| • Common mode interference, min.                                                                | 120 dB                                                                 |
| Interrupts/diagnostics/status information                                                       |                                                                        |
| Alarms                                                                                          | Yes                                                                    |
| Diagnostic functions                                                                            | Yes; Can be read out                                                   |
| Alarms                                                                                          |                                                                        |

|                                                   |                                                            |
|---------------------------------------------------|------------------------------------------------------------|
| • Diagnostic alarm                                | Yes                                                        |
| Diagnostic messages                               |                                                            |
| • Monitoring the supply voltage                   | Yes                                                        |
| • Wire-break                                      | Yes                                                        |
| Diagnostics indication LED                        |                                                            |
| • for status of the inputs                        | Yes                                                        |
| • for maintenance                                 | Yes                                                        |
| 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                                                        |
| Ambient conditions                                |                                                            |
| Free fall                                         |                                                            |
| • Fall height, max.                               | 0.3 m; five times, in product package                      |
| Ambient temperature during operation              |                                                            |
| • min.                                            | -20 °C                                                     |
| • max.                                            | 60 °C                                                      |
| • horizontal installation, min.                   | -20 °C                                                     |
| • horizontal installation, max.                   | 60 °C                                                      |
| • vertical installation, min.                     | -20 °C                                                     |
| • vertical installation, max.                     | 50 °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                                 |                                                            |
| • Operation at 25 °C without condensation, max.   | 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                                |                                                            |

|                            |            |
|----------------------------|------------|
| Enclosure material (front) |            |
| • Plastic                  | Yes        |
| Dimensions                 |            |
| Width                      | 45 mm      |
| Height                     | 100 mm     |
| Depth                      | 75 mm      |
| Weights                    |            |
| Weight, approx.            | 220 g      |
| last modified:             | 07/12/2018 |