

SIMATIC S7-300, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 8 AI, 13 BIT RESOLUTION, U/I/RESISTANCE/PT100, NI100, NI1000, LG-NI1000, PTC / KTY, 66 MS MODULE UPDATE, 1 X 40 PIN



Figure similar

| Input current                                                         |                                          |
|-----------------------------------------------------------------------|------------------------------------------|
| from backplane bus 5 V DC, max.                                       | 90 mA                                    |
| Power loss                                                            |                                          |
| Power loss, typ.                                                      | 0.4 W                                    |
| Analog inputs                                                         |                                          |
| Number of analog inputs                                               | 8                                        |
| • For resistance measurement                                          | 8                                        |
| permissible input voltage for voltage input (destruction limit), max. | 30 V; 12 V continuous, 30 V for max. 1 s |
| permissible input current for current input (destruction limit), max. | 40 mA                                    |
| Input ranges                                                          |                                          |
| • Voltage                                                             | Yes                                      |
| • Current                                                             | Yes                                      |
| • Thermocouple                                                        | No                                       |
| • Resistance thermometer                                              | Yes                                      |
| • Resistance                                                          | Yes                                      |

| Input ranges (rated values), voltages      |                |
|--------------------------------------------|----------------|
| • 0 to +10 V                               | Yes            |
| • Input resistance (0 to 10 V)             | 100 k $\Omega$ |
| • 1 V to 5 V                               | Yes            |
| • Input resistance (1 V to 5 V)            | 100 k $\Omega$ |
| • 1 V to 10 V                              | No             |
| • -1 V to +1 V                             | Yes            |
| • Input resistance (-1 V to +1 V)          | 100 k $\Omega$ |
| • -10 V to +10 V                           | Yes            |
| • Input resistance (-10 V to +10 V)        | 100 k $\Omega$ |
| • -2.5 V to +2.5 V                         | No             |
| • -250 mV to +250 mV                       | No             |
| • -5 V to +5 V                             | Yes            |
| • Input resistance (-5 V to +5 V)          | 100 k $\Omega$ |
| • -50 mV to +50 mV                         | Yes            |
| • Input resistance (-50 mV to +50 mV)      | 100 k $\Omega$ |
| • -500 mV to +500 mV                       | Yes            |
| • Input resistance (-500 mV to +500 mV)    | 100 k $\Omega$ |
| • -80 mV to +80 mV                         | No             |
| Input ranges (rated values), currents      |                |
| • 0 to 20 mA                               | Yes            |
| • Input resistance (0 to 20 mA)            | 100 $\Omega$   |
| • -10 mA to +10 mA                         | No             |
| • -20 mA to +20 mA                         | Yes            |
| • Input resistance (-20 mA to +20 mA)      | 100 $\Omega$   |
| • -3.2 mA to +3.2 mA                       | No             |
| • 4 mA to 20 mA                            | Yes            |
| • Input resistance (4 mA to 20 mA)         | 100 $\Omega$   |
| Input ranges (rated values), thermocouples |                |
| • Type B                                   | No             |
| • Type C                                   | No             |
| • Type E                                   | No             |
| • Type J                                   | No             |
| • Type K                                   | No             |
| • Type L                                   | No             |
| • Type N                                   | No             |
| • Type R                                   | No             |
| • Type S                                   | No             |
| • Type T                                   | No             |
| • Type U                                   | No             |
| • Type TXK/TXK(L) to GOST                  | No             |

|                                                               |                                                                                                              |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Input ranges (rated values), resistance thermometer           |                                                                                                              |
| • Cu 10                                                       | No                                                                                                           |
| • Ni 100                                                      | Yes; Standard/climate                                                                                        |
| • Input resistance (Ni 100)                                   | 100 MΩ                                                                                                       |
| • Ni 1000                                                     | Yes                                                                                                          |
| • Input resistance (Ni 1000)                                  | 100 MΩ                                                                                                       |
| • LG-Ni 1000                                                  | Yes; Standard/climate                                                                                        |
| • Input resistance (LG-Ni 1000)                               | 100 MΩ                                                                                                       |
| • Ni 120                                                      | No                                                                                                           |
| • Ni 200                                                      | No                                                                                                           |
| • Ni 500                                                      | No                                                                                                           |
| • Pt 100                                                      | Yes; Standard/climate                                                                                        |
| • Input resistance (Pt 100)                                   | 100 MΩ                                                                                                       |
| • Pt 1000                                                     | No                                                                                                           |
| • Pt 200                                                      | No                                                                                                           |
| • Pt 500                                                      | No                                                                                                           |
| Input ranges (rated values), resistors                        |                                                                                                              |
| • 0 to 150 ohms                                               | No                                                                                                           |
| • 0 to 300 ohms                                               | No                                                                                                           |
| • 0 to 600 ohms                                               | Yes                                                                                                          |
| • Input resistance (0 to 600 ohms)                            | 100 MΩ                                                                                                       |
| • 0 to 6000 ohms                                              | Yes                                                                                                          |
| • Input resistance (0 to 6000 ohms)                           | 100 MΩ                                                                                                       |
| Thermocouple (TC)                                             |                                                                                                              |
| Temperature compensation                                      |                                                                                                              |
| — parameterizable                                             | No                                                                                                           |
| — internal temperature compensation                           | No                                                                                                           |
| — external temperature compensation with compensations socket | No                                                                                                           |
| Characteristic linearization                                  |                                                                                                              |
| • parameterizable                                             | Yes                                                                                                          |
| — for thermocouples                                           | No                                                                                                           |
| — for resistance thermometer                                  | yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con. |
| Cable length                                                  |                                                                                                              |
| • shielded, max.                                              | 200 m; max. 50 m at 50 mV                                                                                    |
| Analog value generation for the inputs                        |                                                                                                              |
| Measurement principle                                         | integrating                                                                                                  |
| Integration and conversion time/resolution per channel        |                                                                                                              |
| • Resolution with overrange (bit including sign), max.        | 13 bit                                                                                                       |
| • Integration time, parameterizable                           | Yes; 60 / 50 ms                                                                                              |

|                                                                        |            |
|------------------------------------------------------------------------|------------|
| • Basic conversion time (ms)                                           | 66 / 55 ms |
| • Interference voltage suppression for interference frequency f1 in Hz | 50 / 60 Hz |

## Encoder

### Connection of signal encoders

|                                                         |                           |
|---------------------------------------------------------|---------------------------|
| • for current measurement as 2-wire transducer          | Yes; with external supply |
| • for current measurement as 4-wire transducer          | Yes                       |
| • for resistance measurement with two-wire connection   | Yes                       |
| • for resistance measurement with three-wire connection | Yes                       |
| • for resistance measurement with four-wire connection  | Yes                       |

## Errors/accuracies

### Operational error limit in overall temperature range

|                                                          |                                                                                                                                  |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| • Voltage, relative to input range, (+/-)                | 0.6 %; +/-0.6% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); +/-0.5% (+/-50 mV, 500 mV, 1 V)                                              |
| • Current, relative to input range, (+/-)                | 0.5 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA                                                                                          |
| • Resistance, relative to input range, (+/-)             | 0.5 %; 0 to 6 kohms, 0 to 600 kohms                                                                                              |
| • Resistance thermometer, relative to input range, (+/-) | 1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard) |

### Basic error limit (operational limit at 25 °C)

|                                                          |                                                                                                                                  |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| • Voltage, relative to input range, (+/-)                | 0.4 %; 0.4% (+/-5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (+/-50 mV, 500 mV, 1 V)                                                    |
| • Current, relative to input range, (+/-)                | 0.3 %; +/-20 mA, 0 to 20 mA, 4 to 20 mA                                                                                          |
| • Resistance, relative to input range, (+/-)             | 0.3 %; 0 to 6 kohms, 0 to 600 kohms                                                                                              |
| • Resistance thermometer, relative to input range, (+/-) | 1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic) |

## Interrupts/diagnostics/status information

|                      |    |
|----------------------|----|
| Diagnostic functions | No |
|----------------------|----|

### Alarms

|                     |    |
|---------------------|----|
| • Diagnostic alarm  | No |
| • Limit value alarm | No |

### Diagnostic messages

|                                   |    |
|-----------------------------------|----|
| • Diagnostic information readable | No |
|-----------------------------------|----|

### Diagnostics indication LED

|                        |    |
|------------------------|----|
| • Group error SF (red) | No |
|------------------------|----|

## Potential separation

### Potential separation analog inputs

|                                          |     |
|------------------------------------------|-----|
| • between the channels and backplane bus | Yes |
|------------------------------------------|-----|

## Isolation

|                          |            |
|--------------------------|------------|
| Isolation tested with    | 500 V DC   |
| Connection method        |            |
| required front connector | 40-pin     |
| Dimensions               |            |
| Width                    | 40 mm      |
| Height                   | 125 mm     |
| Depth                    | 117 mm     |
| Weights                  |            |
| Weight, approx.          | 250 g      |
| <b>last modified:</b>    | 10/28/2016 |