



Operating mode	
• Oversampling	No
• MSI	No
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, max.	35 mA
Power loss	
Power loss, typ.	0.75 W
Address area	
Address space per module	
• Address space per module, max.	8 byte; + 1 byte for QI information
Hardware configuration	
Automatic encoding	Yes
• Mechanical coding element	Yes
• Type of mechanical coding element	Type A
Selection of BaseUnit for connection variants	
• 2-wire connection	BU type A0, A1
• 3-wire connection	BU type A0, A1
Analog inputs	
Number of analog inputs	4
permissible input voltage for voltage input (destruction limit), max.	30 V
Constant measurement current for resistance-type transmitter, typ.	0.7 mA; 1.7 mA for Cu10 sensors
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• -1 V to +1 V	Yes; 16 bit incl. sign
— Input resistance (-1 V to +1 V)	1 MΩ
• -250 mV to +250 mV	Yes; 16 bit incl. sign

- Input resistance (-250 mV to +250 mV) 1 MΩ
- -50 mV to +50 mV Yes; 16 bit incl. sign
  - Input resistance (-50 mV to +50 mV) 1 MΩ
- -80 mV to +80 mV Yes; 16 bit incl. sign
  - Input resistance (-80 mV to +80 mV) 1 MΩ

#### Input ranges (rated values), thermocouples

- Type B Yes; 16 bit incl. sign
  - Input resistance (Type B) 1 MΩ
- Type C Yes; 16 bit incl. sign
  - Input resistance (Type C) 1 MΩ
- Type E Yes; 16 bit incl. sign
  - Input resistance (Type E) 1 MΩ
- Type J Yes; 16 bit incl. sign
  - Input resistance (type J) 1 MΩ
- Type K Yes; 16 bit incl. sign
  - Input resistance (Type K) 1 MΩ
- Type L Yes; 16 bit incl. sign
  - Input resistance (Type L) 1 MΩ
- Type N Yes; 16 bit incl. sign
  - Input resistance (Type N) 1 MΩ
- Type R Yes; 16 bit incl. sign
  - Input resistance (Type R) 1 MΩ
- Type S Yes; 16 bit incl. sign
  - Input resistance (Type S) 1 MΩ
- Type T Yes; 16 bit incl. sign
  - Input resistance (Type T) 1 MΩ
- Type U Yes; 16 bit incl. sign
  - Input resistance (Type U) 1 MΩ
- Type TXK/TXK(L) to GOST Yes; 16 bit incl. sign
  - Input resistance (Type TXK/TXK(L) to GOST) 1 MΩ

#### Input ranges (rated values), resistance thermometer

- Cu 10 Yes; 16 bit incl. sign
  - Input resistance (Cu 10) 1 MΩ
- Ni 100 Yes; 16 bit incl. sign
  - Input resistance (Ni 100) 1 MΩ
- Ni 1000 Yes; 16 bit incl. sign
  - Input resistance (Ni 1000) 1 MΩ
- LG-Ni 1000 Yes; 16 bit incl. sign
  - Input resistance (LG-Ni 1000) 1 MΩ
- Ni 120 Yes; 16 bit incl. sign

— Input resistance (Ni 120)	1 MΩ
• Ni 200	Yes; 16 bit incl. sign
— Input resistance (Ni 200)	1 MΩ
• Ni 500	Yes; 16 bit incl. sign
— Input resistance (Ni 500)	1 MΩ
• Pt 100	Yes; 16 bit incl. sign
— Input resistance (Pt 100)	1 MΩ
• Pt 1000	Yes; 16 bit incl. sign
— Input resistance (Pt 1000)	1 MΩ
• Pt 200	Yes; 16 bit incl. sign
— Input resistance (Pt 200)	1 MΩ
• Pt 500	Yes; 16 bit incl. sign
— Input resistance (Pt 500)	1 MΩ
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes; 15 bit
— Input resistance (0 to 150 ohms)	1 MΩ
• 0 to 300 ohms	Yes; 15 bit
— Input resistance (0 to 300 ohms)	1 MΩ
• 0 to 600 ohms	Yes; 15 bit
— Input resistance (0 to 600 ohms)	1 MΩ
• 0 to 3000 ohms	Yes; 15 bit
— Input resistance (0 to 3000 ohms)	1 MΩ
• 0 to 6000 ohms	Yes; 15 bit
— Input resistance (0 to 6000 ohms)	1 MΩ
• PTC	Yes; 15 bit
— Input resistance (PTC)	1 MΩ
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— parameterizable	Yes
— Reference channel of the module	Yes
— internal comparison point	Yes; with BaseUnit type A1
— Reference channel of the group	Yes
— Number of reference channel groups	4; Group 0 to 3
— fixed reference temperature	Yes
<b>Cable length</b>	
• shielded, max.	200 m; 50 m with thermocouples
<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

<ul style="list-style-type: none"> <li>• Integration time, parameterizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> <li>— additional processing time for wire-break check</li> <li>— additional power line wire-break check</li> </ul> </li> </ul>	<p>2 ms; In the ranges resistance thermometers, resistors and thermocouples</p> <p>2 ms; for 3/4 wire transducer (resistance thermometer and resistor)</p>
<ul style="list-style-type: none"> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	16.6 / 50 / 60 Hz
<ul style="list-style-type: none"> <li>• Conversion time (per channel)</li> </ul>	180 / 60 / 50 ms

### Smoothing of measured values

<ul style="list-style-type: none"> <li>• Number of smoothing levels</li> </ul>	4; None; 4/8/16 times
<ul style="list-style-type: none"> <li>• parameterizable</li> </ul>	Yes

### Encoder

#### Connection of signal encoders

<ul style="list-style-type: none"> <li>• for voltage measurement</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with two-wire connection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with three-wire connection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for resistance measurement with four-wire connection</li> </ul>	Yes

### Errors/accuracies

Linearity error (relative to input range), (+/-)	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.0009 %/K; ±0.005 % / K at thermocouple
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %

#### Operational error limit in overall temperature range

<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.1 %
<ul style="list-style-type: none"> <li>• Resistance, relative to input range, (+/-)</li> </ul>	0.1 %

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

<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.05 %
<ul style="list-style-type: none"> <li>• Resistance, relative to input range, (+/-)</li> </ul>	0.05 %

#### Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , f1 = interference frequency

<ul style="list-style-type: none"> <li>• Series mode interference (peak value of interference &lt; rated value of input range), min.</li> </ul>	70 dB
<ul style="list-style-type: none"> <li>• Common mode voltage, max.</li> </ul>	10 V
<ul style="list-style-type: none"> <li>• Common mode interference, min.</li> </ul>	90 dB

### Interrupts/diagnostics/status information

Diagnostics function	Yes
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#### Alarms

• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• 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>	
<b>Potential separation channels</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
<b>Permissible potential difference</b>	
between the inputs (UCM)	10 V DC
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; < 0 °C as of FS08
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS08
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>last modified:</b>	11/04/2020