Universal transmitter

4116

- Input for RTD, TC, Ohm, potentiometer, mA and V
- 2-wire supply > 16 V
- FM-approved for installation in Div. 2
- Output for current, voltage and 2 relays
- Universal AC or DC supply

Application
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with 2 pairs of potential-free relay contacts and analog output.
- Galvanic separation of analog signals and measurement of floating signals.
- The 4116 is designed according to strict safety requirements and is therefore suitable for application in SIL 2 installations.
- Suitable for the use in systems up to Performance Level “d” according to ISO-13849.

Technical characteristics
- When 4116 is used in combination with the 45xx display / programming units, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 4-port 2.3 kVAC galvanic isolation.

Mounting / installation / programming
- Very low power consumption means units can be mounted side by side without an air gap – even at 60°C ambient temperature.
- Configuration, monitoring, 2-point process calibration and more are accomplished using PR’s 45xx detachable displays.
- All programming can be password-protected.

Applications

Input signals:

<table>
<thead>
<tr>
<th>Current</th>
<th>Voltage</th>
<th>Potentiometer</th>
<th>RTD and linR</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Connection, 2 wires</td>
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</table>

Output signals:

<table>
<thead>
<tr>
<th>Analog, 0-4...20 mA and voltage</th>
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<tbody>
<tr>
<td>12</td>
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<td>13</td>
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Supply:

<table>
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<tr>
<th>31</th>
<th>32</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
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<tbody>
<tr>
<td>31</td>
<td>32</td>
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<td>21</td>
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</tbody>
</table>

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### Environmental Conditions
- Operating temperature: -20°C to +60°C
- Storage temperature: -20°C to +85°C
- Calibration temperature: 20° to 28°C
- Relative humidity: < 95% RH (non-cond.)
- Protection degree: IP20

### Mechanical specifications
- Dimensions (HxWxD): 109 x 23.5 x 104 mm
- Weight incl. 4501/451x (approx.): 175 g
- Wire size: 0.13...2.08 mm² AWG 26...14 stranded wire
- Screw terminal torque: 0.5 Nm
- Vibration: IEC 6066-2-6
- 2...13.2 Hz: ±1 mm
- 13.2...100 Hz: ±0.7 g

### Common specifications
- Supply voltage, universal: 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
- Fuse: 400 mA SB / 250 VAC
- Max. required power: ≤ 2.5 W
- Max. power dissipation: ≤ 2.5 W
- Isolation voltage:
  - Test voltage: 2.3 kVAC
  - Working voltage: 250 VAC (reinforced) / 500 VAC (basic)
- Response time:
  - Temperature input: (0...90%, 100...10%) ≤ 1 s
  - mA / V input: (0...90%, 100...10%) ≤ 400 ms
- Auxiliary supplies:
  - 2-w. supply (term. 44...43):
    - 25...16 VDC / 0...20 mA
  - Programming:
    - PR 4500 communication interfaces
  - Signal dynamics, input:
    - 24 bit
  - Signal dynamics, output:
    - 16 bit
  - Signal / noise ratio:
    - Min. 60 dB (0...100 kHz)
  - Accuracy:
    - Better than 0.1% of sel. range
  - Extended EMC immunity: NAMUR NE21, A criterion, burst: < ±1% of span

### Input specifications
- RTD input
  - RTD type:
    - Pt10/20/50/100/200/250;
    - Pt300/400/500/1000;
    - Ni50/100/120/1000;
    - Cu10/20/50/100
  - Cable resistance per wire: 50 Ω (max.)
  - Sensor current: Nom. 0.2 mA
  - Effect of sensor cable resistance (3-4-wire):
    - < 0.002 Ω / Ω
  - Sensor error detection:
    - Yes
  - Short circuit detection:
    - < 15 Ω

### Output specifications
- Current output
  - Programmable signal ranges: 0...0/20...4/20...0/20...4 mA
  - Load (@ current output): ≤ 800 Ω
  - Sensor error indication: ≤ 0.01% of span / 100 Ω
  - NAMUR NE43 upscale/downscale: ≤ 23 mA / 3.5 mA
  - Output limitation, on 0...20 and 20...4 mA signals: ≤ 3.8...20.5 mA
  - Output limitation, on 0...20 and 20...0 mA signals: ≤ 0...20.5 mA
  - Current limit: ≤ 28 mA

### Voltage output
- Signal range:
  - 0...10 VDC
  - Programmable signal ranges: 0/0/2.1...1/0/1...5 / 0/2...10; 1...0.2/0; 5...1/0; 10...2/0 V
  - Load (@ voltage output): ≤ 500 kΩ

### Relay output
- Relay functions:
  - Setpoint, Window, Sensor error, Latch, Power and Off
- Max. voltage: 250 VAC / VDC
- Max. current:
  - 2 A
- Max. AC power: 500 VA
- Max. DC current, resistive load: > 30 VDC

### Protective authority requirements
- EMC: 2014/30/EU
- LVD: 2014/35/EU
- RoHS: 2011/65/EU
- EAC: TR-CU 002/2011

### Approvals
- cUL us, UL 508: E231911
- FM: 3025177
- DNV-GL Marine: TA0000101
- EU RO MR Type Approval: MRA0000002
Hardware assessed for use in SIL applications