

## 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



#### Advanced features

- Programmable via detachable display front (4501), process calibration, signal and relay simulation, password protection, error diagnostics and selection of help text in several languages.

#### Application

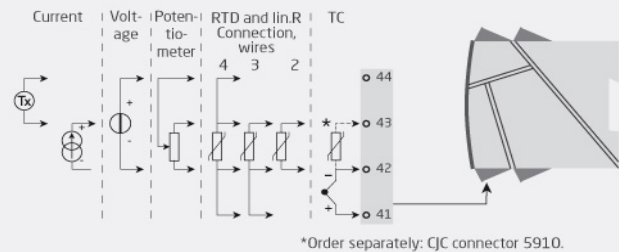
- Linearized, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analog current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- 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.

#### Technical characteristics

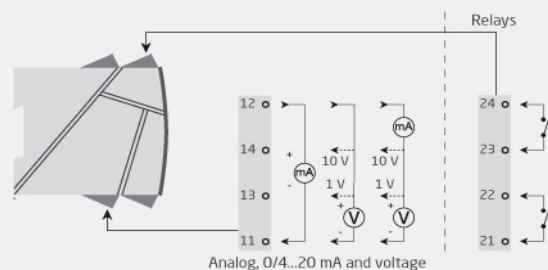
- When 4116 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates 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.

#### Connections

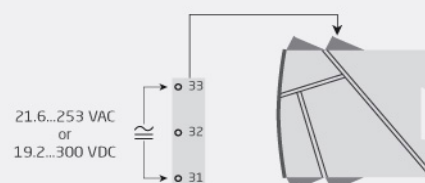
##### Input signals:



##### Output signals:



##### Supply:



Order:

Type
4116

**Environmental Conditions**

Specifications range.....	-20°C to +60°C
Storage temperature.....	-20°C to +85°C
Calibration temperature.....	20...28°C
Relative humidity.....	< 95% RH (non-cond.)
Protection degree.....	IP20

**Mechanical specifications**

Dimensions (HxWxD).....	109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ 4501 / 4511.....	109 x 23.5 x 116 / 131 mm
Weight approx.....	170 g
Weight incl. 4501 / 4511 (approx.).....	185 g / 270 g
Wire size.....	1 x 2.5 mm <sup>2</sup> stranded wire
Screw terminal torque.....	0.5 Nm
Vibration.....	IEC 60068-2-6 : 2007
Vibration: 2...13.2 Hz.....	±1 mm
Vibration: 13.2...100 Hz.....	±0.7 g

**Common specifications**

**Supply**

Supply voltage, universal.....	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
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**Isolation voltage**

Isolation voltage, test / working.....	2.3 kVAC / 250 VAC
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**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
Fuse.....	400 mA SB / 250 VAC
Max. required power.....	≤ 2.5 W
Programming.....	Communication enabler 4511 / Programming front 4501
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Accuracy.....	Better than 0.1% of selected range
EMC immunity influence.....	< ±0.5% of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst.....	< ±1% of span

**Input specifications**

**RTD input**

RTD type.....	Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000 Ni50, Ni100, Ni120, Ni1000, Cu10, Cu20, Cu50, Cu100
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Cable resistance per wire (max.).....	50 Ω
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

**Linear resistance input**

Linear resistance min...max.....	0 Ω...10000 Ω
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**Potentiometer input**

Potentiometer min...max.....	10 Ω...100 kΩ
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**TC input**

Thermocouple type.....	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
Cold junction compensation (CJC) via ext. sensor in connector 5910.....	20...28°C ≤ ±1°C, -20...20°C / 28...70°C ≤ 2°C

CJC via internally mounted sensor.....	±(2.0°C + 0.4°C * Δt)
Δt = .....	Internal temperature-ambient temperature

Sensor error detection.....	Yes
Sensor error current: When detecting / else.....	Nom. 2 μA / 0 μA

**Current input**

Measurement range.....	0...20 mA
Programmable measurement ranges.....	0...20 and 4...20 mA
Input resistance.....	Nom. 20 Ω + PTC 50 Ω
Sensor error detection: Loop break 4...20 mA.....	Yes

**Voltage input**

Measurement range.....	0...12 VDC
Programmable measurement ranges.....	0/0.2...1, 0/1...5, 0/2...10 VDC
Input resistance.....	Nom. 10 MΩ

**Output specifications**

**Current output**

Signal range.....	0...20 mA
Programmable signal ranges.....	0...20 / 4...20 / 20...0 and 20...4 mA
Load (@ current output).....	≤ 800 Ω
Load stability.....	≤0.01% of span / 100 Ω
Sensor error indication.....	0 / 3.5 / 23 mA / none
NAMUR NE 43 Upscale/Downscale.....	23 mA / 3.5 mA
Output limitation, on 4...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; 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 VRMS
Max. current.....	2 AAC or 1 ADC
Max. AC power.....	500 VA

**Observed authority requirements**

EMC.....	2014/30/EU
LVD.....	2014/35/EU

**Approvals**

FM.....	3025177
UL.....	UL 508
EAC.....	TR-CU 020/2011
DNV Marine.....	Stand. f. Certific. No. 2.4
SIL.....	Hardware assessed for use in SIL applications