

UNIVERSAL TRANSMITTER



- 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:

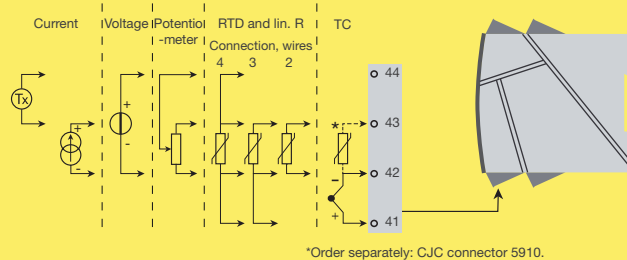
- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analogue current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with 2 pairs of potential-free relay contacts and analogue output.
- Galvanic separation of analogue signals and measurement of floating signals.
- The 4116 is designed according to strict safety requirements and is thus suitable for application in SIL 2 installations.

Technical characteristics:

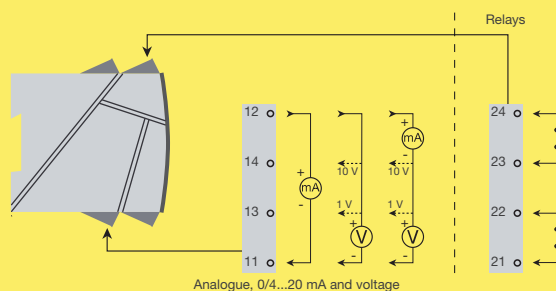
- When 4116 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green / red front LED indicates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

Applications

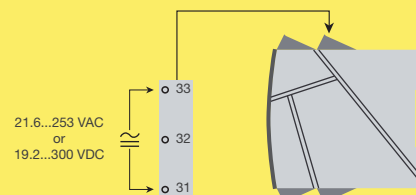
Input signals:



Output signals:



Supply:



Order codes:

4116 = Universal transmitter

4501 = Display / programming front

5910 = CJC connector

PR 4501 Display / programming front



Application:

- Communications interface for modification of operational parameters in 4116.
- Can be moved from one 4116 device to another and download the configuration of the first transmitter to subsequent transmitters.
- Fixed display for visualisation of process data and status.

Technical characteristics:

- LCD display with 4 lines; Line 1 (H=5.57 mm) shows input signal, line 2 (H=3.33 mm) shows units, line 3 (H=3.33 mm) shows analogue output or TAG no. and line 4 shows communication and relay status.
- Programming access can be blocked by assigning a password. The password is saved in the transmitter in order to ensure a high degree of protection against unauthorised modifications to the configuration.

Mounting / installation:

- Click 4501 onto the front of 4116.

Electrical specifications:

Specifications range:

-20°C to +60°C

Common specifications:

Supply voltage, universal	21.6...253 VAC, 50...60 Hz or 19.2...300 VDC
Max. consumption.....	≤ 2.5 W
Fuse.....	400 mA SB / 250 VAC
Isolation voltage, test / operation.....	2.3 kVAC / 250 VAC
Communications interface	Programming front 4501
Signal / noise ratio.....	Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%):	
Temperature input	≤ 1 s
mA / V input	≤ 400 ms
Calibration temperature.....	20...28°C
Accuracy, the greater of the general and basic values:	

General values		
Input type	Absolute accuracy	Temperature coefficient
All	≤ ±0.1% of span	≤ ±0.01% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
mA	≤ ±4 µA	≤ ±0.4 µA / °C
Volt	≤ ±20 µV	≤ ±2 µV / °C
Pt100	≤ ±0.2°C	≤ ±0.01°C / °C
Linear resistance	≤ ±0.1 Ω	≤ ±0.01 Ω / °C
Potentiometer	≤ ±0.1 Ω	≤ ±0.01 Ω / °C
TC type: E, J, K, L, N, T, U	≤ ±1°C	≤ ±0.05°C / °C
TC type: R, S, W3, W5, LR	≤ ±2°C	≤ ±0.2°C / °C
TC type: B 160...400°C	≤ ±4.5°C	≤ ±0.45°C / °C
TC type: B 400...1820°C	≤ ±2°C	≤ ±0.2°C / °C

EMC immunity influence	< ±0.5% of span
Extended EMC immunity:	
NAMUR NE 21, A criterion, burst.....	< ±1% of span

Auxiliary supplies:

2-wire supply (terminal 44...43)	25...16 VDC / 0...20 mA
Max. wire size.....	1 x 2.5 mm ² stranded wire
Screw terminal torque	0.5 Nm
Relative humidity	< 95% RH (non-cond.)
Dimensions, w/o/w 4501 (HxBxD)	109 x 23.5 x 104/116 mm
Protection degree	IP20
Weight	170 g / 185 g with 4501

RTD, linear resistance and potentiometer input:

Input type	Min. value	Max. value	Standard
Pt10...Pt1000	-200°C	+850°C	IEC 60751
Ni50...Ni1000	-60°C	+250°C	DIN 43760
Cu10...Cu100	-200°C	+260°C	α = 0.00427
Lin. R	0 Ω	10000 Ω	-
Potentiometer	10 Ω	100 kΩ	-

Input for RTD types:

Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000, Cu10, Cu20, Cu50, Cu100	
Cable resistance per wire (max.), RTD..	50 Ω
Sensor current, RTD.....	Nom. 0.2 mA

Effect of sensor cable resistance (3- / 4-wire), RTD	< 0.002 Ω / Ω
Sensor error detection, RTD.....	Yes
Short circuit detection, RTD	< 15 Ω

TC input:

Thermocouple type	B, E, J, K, L, N, R, S, T, U, W3, W5, LR
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Cold junction compensation (CJC):

via external sensor	
in connector 5910	20...28°C ≤ ±1°C
	-20...20°C /
	28...70°C ≤ ±2°C
via internal CJC sensor.....	±(2.0°C + 0.4°C * Δt)
Δt = internal temperature - ambient temperature	
Sensor error detection, all TC types..	Yes
Sensor error current:	
when detecting	Nom. 2 µA
else.....	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

Voltage input:

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

Current output:

Signal range (span).....	0...20 mA
Programmable signal ranges.....	0/4...20 and 20...4/0 mA
Load (max.).....	20 mA / 800 Ω / 16 VDC
Load stability	≤ 0.01% of span / 100 Ω
Sensor error detection.....	0 / 3.5 / 23 mA / none
NAMUR NE43 Upscale/Downscale..	23 mA / 3.5 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 (min.).....	500 kΩ

Relay outputs:

Relay functions.....	Setpoint, Window, Sensor error, Latch, Power and Off
Hysteresis.....	0...100%
On and Off delay	0...3600 s
Max. voltage.....	250 VRMS
Max. current	2 A / AC or 1 A / DC
Max. AC power.....	500 VA
Sensor error detection.....	Break / Make / Hold

Ex / I.S. approval:

FM, applicable in	Cl. I, Div. 2, Gr. A, B, C, D
	Class I, Div. 2, Group IIC
	Zone 2
Max. ambient temperature for T5.....	60°C

Marine approval:

Det Norske Veritas, Ships & Offshore.	Stand. f. Certific. No. 2.4
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GOST R approval:

VNIIM, Cert. No.	www.prelectronics.com
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Observed authority requirements: Standard:

EMC 2004/108/EC	EN 61326-1
LVD 2006/95/EC	EN 61010-1
FM	3600, 3611, 3810 and ISA 82.02.01
UL, Standard for Safety.....	UL 508

of span = of the currently selected measurement range