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:

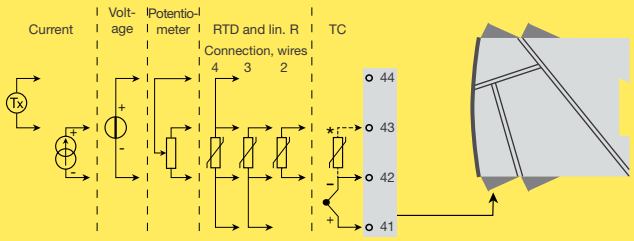
- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analogue current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire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

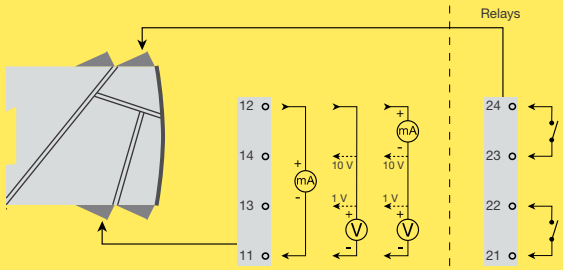
Applications

Input signals:



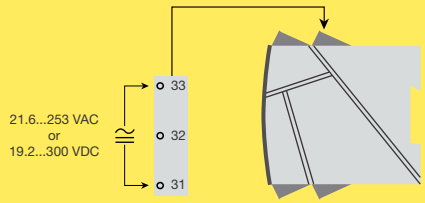
*Order separately: CJC connector 5910.

Output signals:



Analogue, 0/4...20 mA and voltage

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 module 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	1x2.5 mm² stranded wire
Screw terminal torque	0.5 Nm
Relative humidity	< 95% RH (non-cond.)
Dimen., without display front (HxBxD)	109 x 23.5 x 104 mm
Dimensions, w. display front (HxBxD)	109 x 23.5 x 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
Pt100	-200°C	+850°C	IEC60751
Ni100	-60°C	+250°C	DIN 43760
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

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
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, in % / display counts	0.1...25% / 1...2999
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

GOST R approval:

VNIIM, Cert. No.	www.prelectronics.com

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