

# 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 and voltage
- Universal AC or DC supply



### Advanced features:

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

### Application:

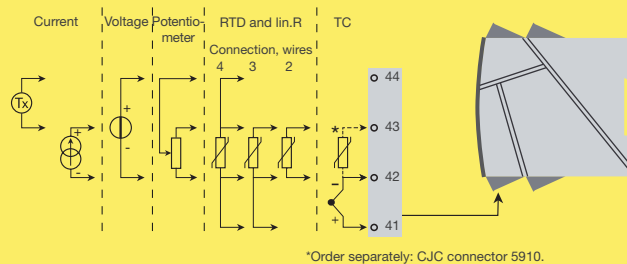
- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analogue current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with standard analogue output.
- Galvanic separation of analogue signals and measurement of floating signals.
- The 4114 is designed according to strict safety requirements and is thus suitable for application in SIL 2 installations.

### Technical characteristics:

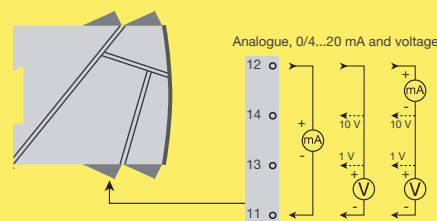
- When 4114 is used with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4114 is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP switches.
- A green / red front LED indicates normal operation and malfunction.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.

## Applications

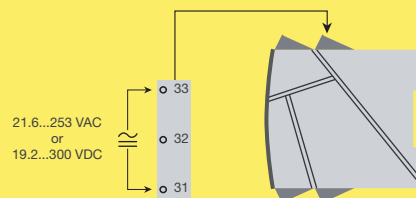
### Input signals:



### Output signals:



### Supply:



**Order codes:**

**4114 = Universal transmitter**

**4501 = Display / programming front**

**5910 = CJC connector**

**PR 4501 Display / programming front**



**Application:**

- Communications interface for modification of operational parameters in 4114.
- Can be moved from one 4114 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 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 4114.

**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..... ≤ 2.0 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<sup>2</sup> stranded wire  
 Screw terminal torque ..... 0.5 Nm  
 Relative humidity..... < 95% RH (non-cond.)  
 Dimensions, wo/w 4501 (HxBxD)..... 109 x 23.5 x 104/116 mm  
 Protection degree..... IP20  
 Weight ..... 145 g / 160 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	-

Cable resistance per wire, RTD (max.). 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:**

Type	Min. value	Max. value	Standard
B	0°C	+1820°C	IEC 60584-1
E	-100°C	+1000°C	IEC 60584-1
J	-100°C	+1200°C	IEC 60584-1
K	-180°C	+1372°C	IEC 60584-1
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC 60584-1
R	-50°C	+1760°C	IEC 60584-1
S	-50°C	+1760°C	IEC 60584-1
T	-200°C	+400°C	IEC 60584-1
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
LR	-200°C	+800°C	GOST 3044-84

**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 NE 43 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

**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