

# UNIVERSAL TRANSMITTER



- Input for RTD, TC, Ohm, potentiometer, mA and V
- 2-wire supply > 16 V
- Mounting on DIN rail or wall
- 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:

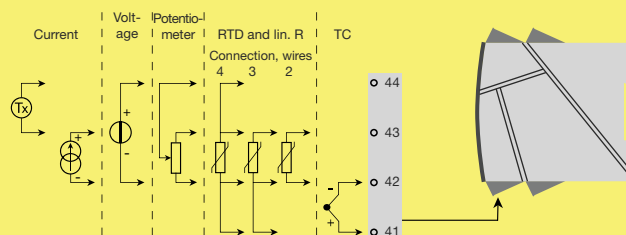
- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analogue current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire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

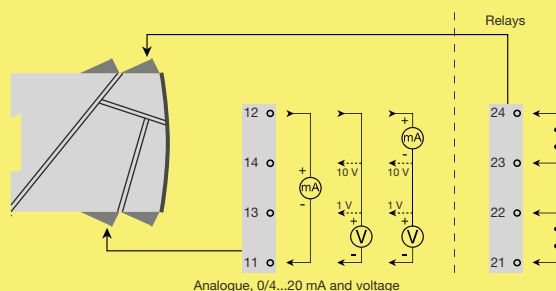
- When 4116 is used in combination with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4116 is designed with electronic hardware switches, it is not necessary to open the module for setting of DIP switches.
- A green / red front LED indicates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

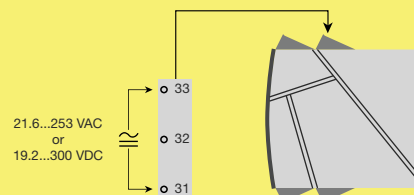
### Input signals:



### Output signals:



### Supply:



**Order codes:****4116 = Universal transmitter****4501 = Display / programming front****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
RTD	≤ ±0.2°C	≤ ±0.01°C/°C
Lin. R	≤ ±0.1 Ω	≤ ±0.01 Ω/°C
Potentiometer	≤ ±0.1 Ω	≤ ±0.01 Ω/°C
TC type: E, J, K, L, N, T,	≤ ±1°C	≤ ±0.05°C/°C
TC type: B, R, S, W3, W5, LR	≤ ±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.)  
 Dimen., without display front (HxBxD). 109 x 23.5 x 104 mm  
 Dimensions, w. display front (HxBxD). 109 x 23.5 x 116 mm  
 Tightness (enclosure / terminals)..... IP50 / IP20  
 Weight ..... 170 g / 185 g with 4501

**RTD, linear resistance and potentiometer input:**

Input type	Min. value	Max. value	Norm
Pt100	-200°C	+850°C	IEC60751
Ni100	-60°C	+250°C	DIN 43760
Lin. R	0 Ω	10000 Ω	-
Potentiometer	10 Ω	100 kΩ	-

Cable resistance p. wire (max.), RTD.... 50 Ω

Sensor current, RTD..... Nom. 0.2 mA

**Effect of sensor cable resistance**

(3- / 4-wire), RTD ..... &lt; 0.002 Ω / Ω

Sensor error detection, RTD..... Yes

Short circuit detection, RTD ..... &lt; 15 Ω

**TC input:**

Type	Min. value	Max. value	Norm
B	+400°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 internally mounted sensor ..... &lt; ±1.0 °C

Sensor error detection, all TC types.. Yes

**Sensor error current:**

when detecting..... Nom. 2 µA

else ..... 0 µA

**Current input:**

Measurement range ..... -1...25 mA

Programmable measurement ranges 0...20 and 4...20 mA

Input resistance..... Nom. 20 Ω + PTC 50 Ω

**Voltage input:**

Measurement ranges..... -20 mV...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

**Relay outputs:**

Relay functions..... Setpoint, Window, Sensor error, 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

**Observed authority requirements: Standard:**

EMC 2004/108/EC:

Emission and immunity ..... EN 61326

LVD 73/23/EEC ..... EN 61010-1

UL, Standard for Safety..... UL 508