

# UNIVERSAL TRIP AMPLIFIER



- Input for RTD, TC, Ohm, potentiometer, mA and V
- 2 adjustable alarm limits
- Mounting on DIN rail or wall
- 2 relay outputs
- Universal AC or DC supply



### Advanced features:

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

### Application:

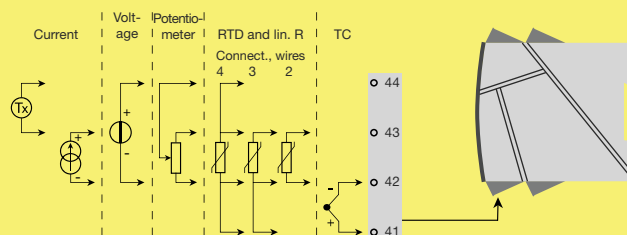
- Process control with 2 pairs of potential-free relay contacts which can be configured to suit any application.
- Trip amplifier with window function defined by a high and a low setpoint. The relay changes state outside the window.
- Sophisticated sensor error surveillance, where one relay holds the state immediately prior to the sensor error, thus allowing the process to continue. The other relay can be set for sensor error alarm so that the defect sensor can be replaced immediately.

### Technical characteristics:

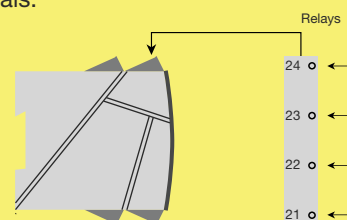
- When 4131 is used with the 4501 display / programming front, all operational parameters can be modified to suit any application. As the 4131 is designed with electronic hardware switches, it is not necessary to open the module for setting of DIP switches.
- A green front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.

## Applications

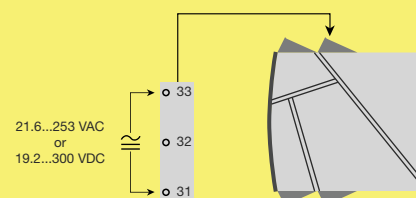
### Input signals:



### Output signals:



### Supply:



**Order codes:**

**4131 = Universal trip amplifier**

**4501 = Display / programming front**

**PR 4501 Display / programming front**



**Application:**

- Communications interface for modification of operational parameters in 4131.
- Can be moved from one 4131 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 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 4131.

**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
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.)  
 Dim., 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 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:**

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 ..... < ±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  
 Program. 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

**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

**of span =** of the currently selected measurement range