UNIVERSAL TRIP AMPLIFIER

- **Input for RTD, TC, Ohm, potentiometer, mA and V**
- **2 adjustable alarm limits**
- **FM-approved for installation in Div. 2**
- **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:

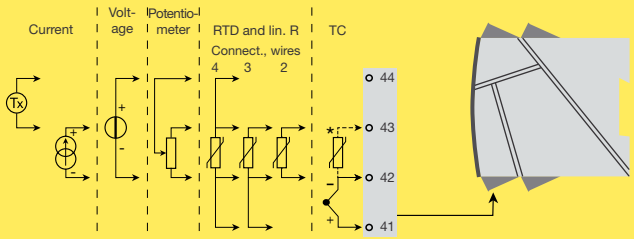
- Process control with 2 pairs of potential-free relay contacts which can be configured to suit any application.
- Trip amplifier with window function defined by a high and a low setpoint. The relay changes state outside the window.
- Relay latch function, where the relay is activated and can only be reset manually.
- 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.

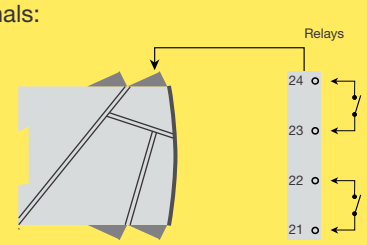
Applications

Input signals:

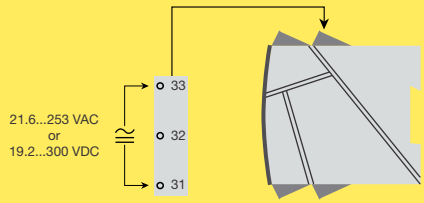


*Order separately: CJC connector 5910.

Output signals:



Supply:



PR electronics
DS CERTIFIED QUALITY SYSTEM AND ENVIRONMENTAL MANAGEMENT SYSTEM DS/EN ISO 9001 DS/EN ISO 14001
Lerbakken 10 · DK-8410 Rønde
Tlf. 8637 2677 · Fax 8637 3085
www.prelectronics.dk

Order codes:

4131 = Universal trip amplifier
4501 = Display / programming front
5910 = CJC connector

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
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 mm² 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
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:

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
Programm. measurement ranges..... 0...20 and 4...20 mA
Input resistance..... Nom. 20 Ω + PTC 50 Ω

Voltage input:

Measurement range ..... 0...12 VDC
Programm. 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, 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