

# Precision RTD Simulator

## Model 4530

Code:	4530 E
Manufacturer:	burster
Delivery:	ex stock
Warranty:	24 months
Issue:	1.7.2004



- Simulation of Pt 100, Pt 200, Pt 500, Pt 1000, Ni 100 and Ni 1000 Sensors
- Accuracy 0.02 °C
- Temperature scales ITS 90, IPTS 68
- Real Ohm simulation
- Control manually or remotely via RS232/IEEE488

### Application

The precision RTD simulator is used where measuring instruments or controlling means with high precision must be examined or calibrated.

The simulator is suitable for calibration laboratory and service centers which need a computer-controlled resistance decade for the automation of calibration procedures.

All standard platinum and nickel RTD can be simulated with very high accuracy according to scales ITS 90 or IPTS 68.

Temperature regulators, transducers etc. often supply a pulsed signal current in order to reduce the self-heating of the RTD. Devices with electronic simulation of RTD are therefore inclined to swinging and do not function with this application. Here, the advantage of the RTD simulator model 4530 becomes obvious as it can simulate the resistance sensor by real Ohm simulation without problems.

Of course the RTD simulator can be used also as classical resistance decade.

### Description

The equipment comes in a sturdy aluminium housing. The keyboard, display and connectors are on the front plate. It makes 2-, 3- and 4-wire connection possible.

Pt 100, Pt 200, Pt 500, Pt 1000, Ni 100 or Ni 1000 can be selected by simple menu navigation. In addition, the selection of temperature scales ITS90 (DIN EN 60751) or IPTS 68 (DIN 43760) and two curves  $\alpha = 0.385$  (European) or  $\alpha = 0.392$  (US) is possible. After entry of the characteristic values the input of the temperature levels can be made very simply by the numeric keyboard. Presently set values are indicated in the display. Relays with low thermovoltage and stable foil resistances with very small temperature coefficients are the heart of the simulator. The simulator is supplied by an internal accu or an external power supply.

**Technical Data**

Range of temperature simulation: - 200 ... 850 °C  
 Type of sensors: Pt 100, Pt 200, Pt 500, Pt 1000, Ni 100 and Ni 1000  
 Temperature scales: ITS 90, IPTS 68  
 PT sensors curves:  $\alpha = 0.385$  (DIN) or  $\alpha = 0.392$  (US)  
 Pt sensors standards: DIN EN 60751  
 Ni sensors standards: DIN 43760  
 Resistance range: 16  $\Omega$  ... 10000  $\Omega$   
 Temperature coefficient: < 1 ppm/°C (16  $\Omega$  ... 2000  $\Omega$ )  
 < 5 ppm/°C (2 k $\Omega$  ... 10 k $\Omega$ )  
 Maximum power dissipation: 0.3 W  
 Maximum current: 100 mA (16 ..... 30  $\Omega$ )  
 50 mA (30 ..... 100  $\Omega$ )  
 20 mA (100 ..... 500  $\Omega$ )  
 10 mA (500 ..... 3000  $\Omega$ )  
 5 mA (3000 ... 10000  $\Omega$ )  
 Connection: 2-, 3- and 4-wire  
 Terminals: 4 mm, gold plated terminals  
 Remote control: RS232-interface, galvanically isolated, IEEE488  
 Reaction time in remote mode: < 3 ms  
 Power supply: internal battery, NC, 12 V / 2.6 Ah, external power line adaptor 15 V / 1 A (100-240 VAC)  
 Operation period: typically 6 hour  
 Customs temperature range: + 5 °C ... + 40 °C  
 - within the specifications 23 °C  $\pm$  5 °C  
 Storage temperature range: - 10 °C ... + 50 °C  
 Protection class: IP 20  
 Dimensions (B x H x D): 325 x 111 x 316 [mm]  
 Weight: 4 kg

**Accuracy**

Specified accuracy is valid after 10 minutes warm-up in temperature range 23 °C  $\pm$  5 °C.  
 Uncertainties include longterm stability, temperature coefficient, linearity, load and line regulation and traceability of factory to National calibration standards. Accuracy assigned in % is related to the set value. Specified accuracy is one year accuracy.

**Application**



**Calibration of temperature measurement, temperature regulators, head transmitters etc. in production**

In production the temperature measurement, temperature regulators, transmitters are calibrated in compliance with the data and/or for the building of a test certificate with the RTD simulator model 4530.  
 Precise temperature values are simulated via PC control or manual input.  
 The real Ohm simulation takes place in 2-, 3- or 4-wire connection.

**Resistance simulation**

Range	Accuracy
16.0000 ... 400.00 $\Omega$	0.003 % + 3 m $\Omega$
400.00 ... 2000.0 $\Omega$	0.005 %
2000.0 ... 10000 $\Omega$	0.015 %

**Pt sensor simulation**

Temperature range	Accuracy			
	Pt 100	Pt 200	Pt 500	Pt 1000
- 200.000 ... 200.000 °C	0.02 °C	0.02 °C	0.02 °C	0.1 °C
200.000 ... 500.000 °C	0.03 °C	0.04 °C	0,06 °C	0.2 °C
500.000 ... 850.000 °C	0.04 °C	0.06 °C	0.15 °C	0.3 °C

**Ni sensor simulation**

Temperature range	Accuracy	
	Ni 100	Ni 1000
- 60.000 ... 250.000 °C	0.02 °C	0.1 °C

**Line resistance simulation**

Parts of the simulator are two resistors of nominal value 10  $\Omega$ , which can be used as resistance simulation. Lead resistance accuracy is 0.1 %, maximum allowed current is 100 mA.

**Order Information**

RTD Simulator with RS232, **Model 4530-V100**  
 Desktop housing version, including power line adaptor, operation manual and application software

RTD Simulator with IEEE488, **Model 4530-V200**  
 Desktop housing version, including power line adaptor, application software

RTD Simulator for installation in a 19" rack **Model 4530-VX1X**  
 3 height units (133 mm)  
 Simulation range to 1.2 M $\Omega$  **on request**