Practical Instrument Electronics

Model 512S
RTD Calibrator
With Auto Stepping
Datasheet

Features

Simulate/Read RTD sensors

Calibrate/Read directly in temperature for your RTD curve

Adjustable output for full temperature range

Several Manufacturers' RTD Curves Available

Platinum, Copper & Nickel

Accurate to ±0.25°C (±0.45°F) with 0.1° Resolution

Resistance accuracy of ±(0.015 % + 0.05) Ω

Auto Stepping

Selectable Step size and step times

Guaranteed to Work with All Pulsed Instruments

Works with a wide variety of transmitters including popular Rosemount and Honeywell Models

Compatible with devices using pulsed excitation currents including PLCs, DCS, Recorders, and all others

Automatic Detection of 2, 3, or 4 Wire Connections

No buttons or switches required, 2W, 3W, or 4W indicator is automatic

A valuable troubleshooting tool

EZ-Dial Knob

Easily adjust output by 0.1°

Pressing down and turning will select a faster dialing speed

EZ-Check Switch

User settable EZ-Check for 0% and 100% span adjustments

Store new EZ-Check values by pressing the EZ-Dial Knob

Uses a standard 9V Alkaline Battery

Superior battery life of 45 hours under typical continuous usage

Easy access to battery compartment

Lightweight, Rugged and Reliable

Small, tough and protected to 60V

Model 512S Datasheet

Description

The Practical Instrument Electronics Model 512S RTD Calibrator provides direct temperature calibration to all types of instruments such as transmitters, recorders, controllers, alarms, data acquisition, and computer systems. Also, the Model 512S reads RTD outputs and displays in temperature. It is compatible with pulsed systems and transmitters (like the Rosemount 3144.) 2, 3, or 4 wire connections are detected automatically. The Model 512S is a superior replacement for decade boxes, eliminating the need for lugging around large equipment and the possibility of misreading RTD tables.

Select from 8 RTD types to source/read in °C or °F with 0.1 ° resolution. Or, select Ω for direct resistance source/read capability.

Use the EZ-Check™ Switch to quickly switch between three stored temperature / Ω outputs. The Auto step mode allows the end user to select the high, mid and low test points along with step size and time. In read mode, the EZ-Check™ Switch recalls minimum and maximum readings. Store/Clear memory with a press of the EZ-Dial™ Knob.

The Practical Instrument Electronics Model 512S offers the highest performance and functions in its class by exceeding the accuracy and functions of many higher priced RTD calibrators. It is a low cost solution for checkout and calibration of all RTD instruments in the field, shop or control room. Contact Practical Instruments Electronics for custom RTD curves, ranges, or special requirements not provided by the Model 512S.

Specifications

General Specifications:

(Unless otherwise indicated all specifications are rated from a nominal 23 °C, 70 % RH for 1 year from calibration)

Temperature Range	-25 to 60 °C (-10 to 140 °F)
Relative Humidity Range	10 % ≤RH ≤90 % (0 to 35 °C), Non-condensing
	10 % ≤RH≤ 70 % (35 to 60 °C), Non-condensing
Size	4.9 X 3.15 X 1.82 inches (125.5 X 80 X 46.2 mm)
Weight	9.1 oz (258 grams)
Battery	9V Alkaline provides 45 hours of continuous use
Miscellaneous	Low battery indication with nominal 1 hour of operation left
	Protection to 60V for up to 30 seconds in duration
	High contrast graphic liquid crystal display with 0.357” (9.07 mm) high digits
Resolution	°C or °F / 0.01 Ω
Span	0.00-400.00 Ω
Accuracy	±(0.015 % of Ω + 0.05) Ω (see accuracy tables for temperature error)
Temperature Coefficient	±0.01 % of span in Ω/°C ambient

RTD Simulation Specifications:

Allowable Excitation Current	100 µA to 10.2 mA, steady or pulsed/intermittent/smart
for accuracies below 100µA add	±10µV/Excitation Current (units are in Ω)
Pulsed Excitation Current Compatibility	DC to 0.01 second pulse widths

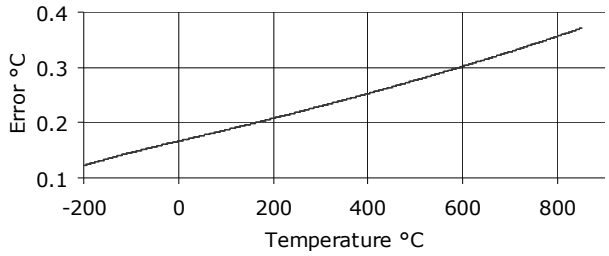
RTD Read Specifications:

Excitation Current	1 mA nominal

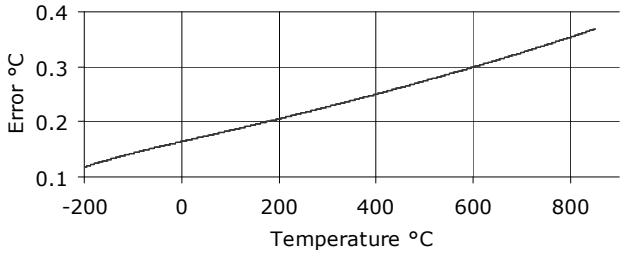
Temperature Accuracy

The following charts give worst-case temperature accuracy based on stated resistance accuracy of ±(0.015 % + 0.05) Ω.

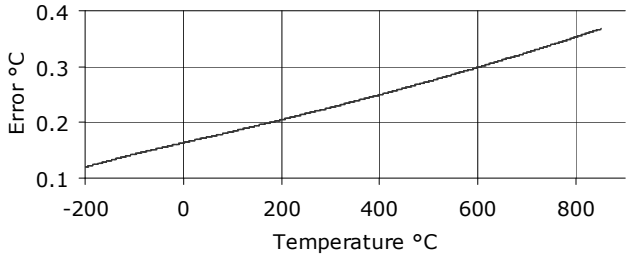
Pt100 TCR=0.00385
-200 to 850 °C



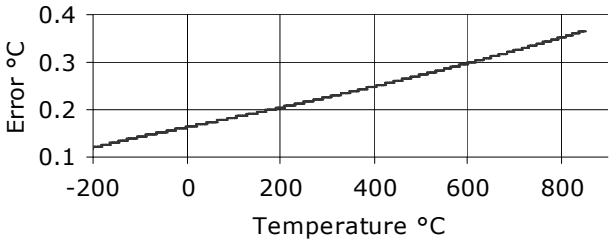
Pt100 TCR=0.003902
-200 to 850 °C



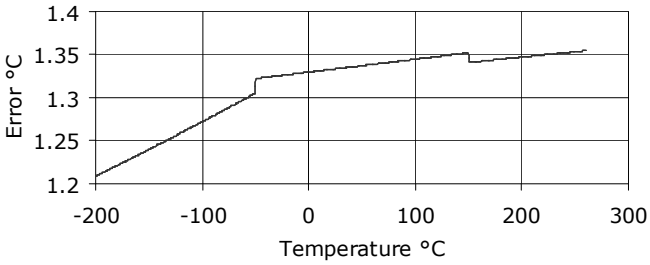
Pt100 TCR=0.003916
-200 to 850 °C



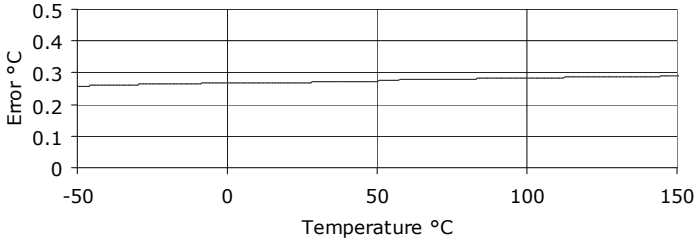
Pt100 TCR=0.003926
-200 to 850 °C



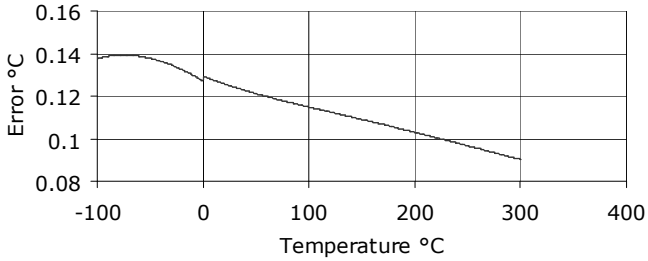
Cu10 TCR=0.00427
-200 to 260 °C



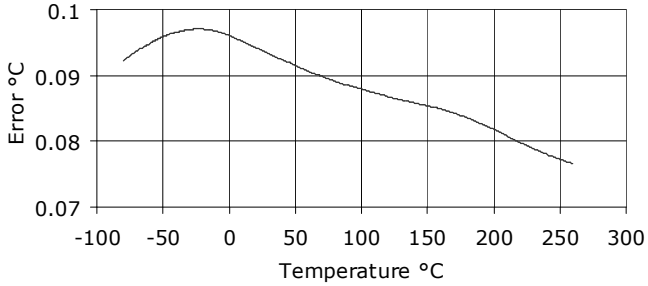
Cu50 TCR=0.00428
-50 to 150 °C



Ni110 TCR=0.00530
-100 to 300 °C



Ni120 TCR=0.00672
-80 to 260 °C



Available Options:

Carrying Case	Part Number: 020-0201

Other Products Available:

RTD Source (Single Type/1° resolution)	Model 510
RTD Source (7 Types, Ω/0.1° resolution)	Model 511
Pt100: α=1.3850, 1.3902, 1.3916, 1.3926	
Cu10: α=1.427	
Ni110: α=1.530	
Ni120: α=1.672	
RTD Read & Source (7 Types, Ω/0.1° resolution)	Model 512
T/C Source (Single Type/1° resolution)	Model 520
T/C Source (8 Types, mV/0.1° resolution)	Model 521
B, E, J, K, N, R, S, T, mV	
T/C Read & Source (8 Types, mV/0.1° resolution)	Model 522
B, E, J, K, N, R, S, T, mV	
Dual RTD – T/C Read & Source	Model 525
with Auto Ramping & Stepping	
4-20 Milliamp Loop Calibrator	Model 530
4-20 Pocket-Mate Milliamp Loop Calibrator	Model 531
4-20 Milliamp Loop Calibrator with Diagnostic	Model 532
4-20/10-50 Dual Range Loop Calibrator	Model 535
Frequency Read & Source with Totalizer	Model 541

Warranty

Our equipment is guaranteed against defective material and workmanship (excluding batteries) for a period of three years from the date of shipment. Claims under guarantee can be made by returning the equipment prepaid to our factory. The equipment will be repaired, replaced or adjusted at our option. The liability of Practical Instrument Electronics (PIE) is restricted to that given under our guarantee. No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Practical Instrument Electronics, Inc. be liable for any special, incidental or consequential damage.

Your Local PIE Representative