



TEL-TRU MANUFACTURING COMPANY

MODEL 512 RTD CALIBRATOR

► 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 $\pm 0.25^{\circ}\text{C}$ ($\pm 0.45^{\circ}\text{F}$) with 0.1° Resolution

- Resistance accuracy of $\pm(0.015\% + 0.05)\ \Omega$

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

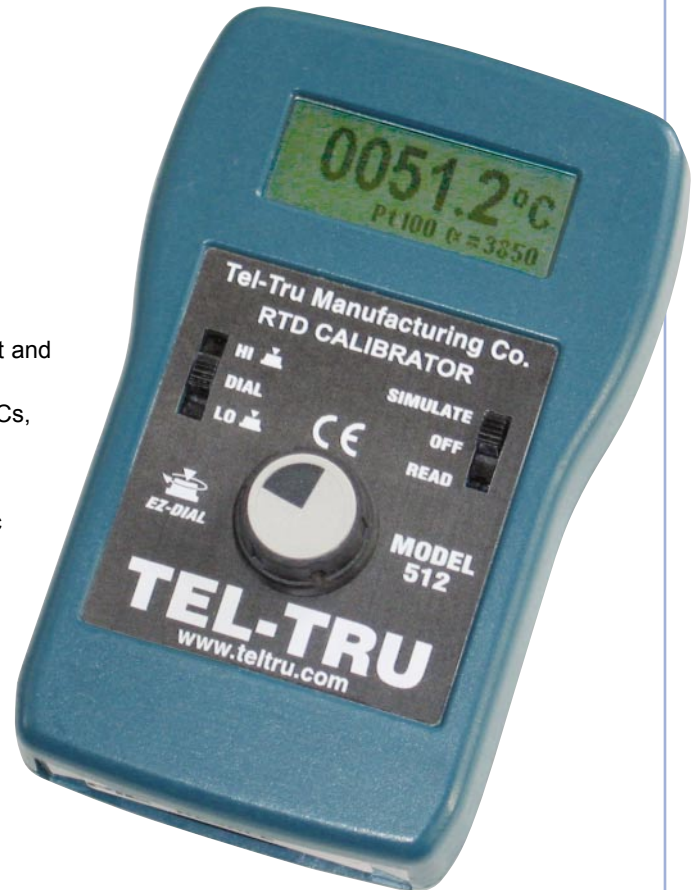
► DESCRIPTION:

The Tel-Tru Model 512 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 512 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 512 is a superior replacement for decade boxes, eliminating the need for lugging around large equipment and the possibility of misreading RTD tables.

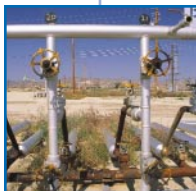
Select from 8 RTD types to source/read in $^{\circ}\text{C}$ or $^{\circ}\text{F}$ with 0.1° resolution. Or, select Ω for direct resistance source/read capability.

Use the EZ-Check Switch to quickly switch between three stored temperature/ Ω outputs. It's easy to customize these values to your application. In read mode, the EZ-Check Switch recalls minimum and maximum readings. Store/Clear memory with a press of the EZ-Dial Knob.

The Tel-Tru Model 512 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 Tel-Tru for custom RTD curves, ranges, or special requirements not provided by the Model 512.



CE APPROVED!



World-Class Instruments

*Since
1916*

*EZ-Dial and EZ-Check are trademarks
of Practical Instrument Electronics, Inc.*

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► GENERAL SPECIFICATIONS:

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

Operating Temperature	-25 to 60 °C (-10 to 140 °F)
Relative Humidity Range	10 % =RH =90 % (0 to 35 °C), 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
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► AVAILABLE OPTIONS:

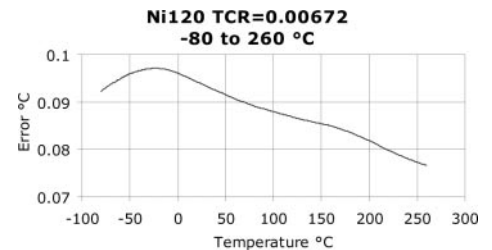
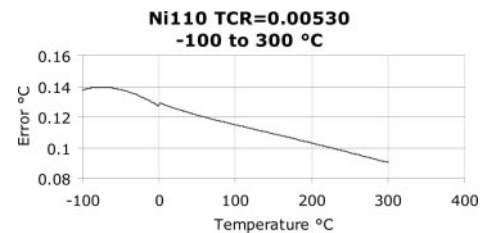
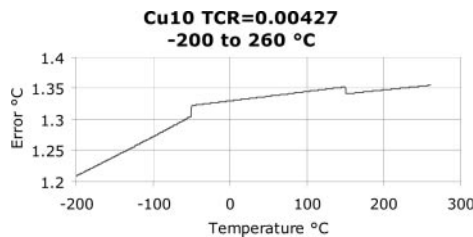
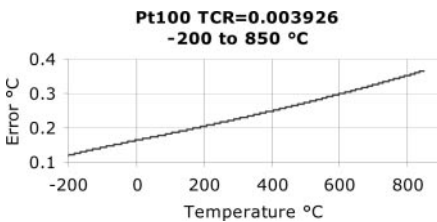
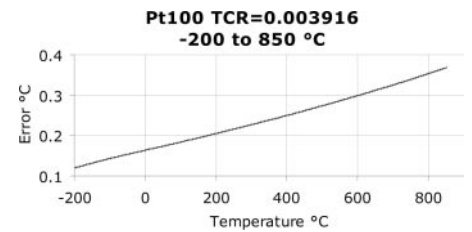
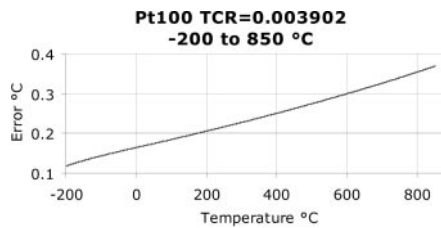
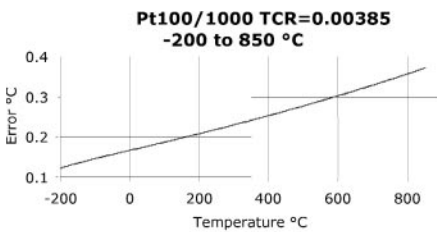
Carrying Case	Part Number: 020-0201
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► ORDERING INFORMATION:

MODEL 512 - RTD Source (8 Types, Ω/0.1° resolution)	
Order Code:	Model 512

► TEMPERATURE ACCURACY:

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



► 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 Tel-Tru Manufacturing Co. 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 Tel-Tru Manufacturing Co. be liable for any special, incidental or consequential damage.



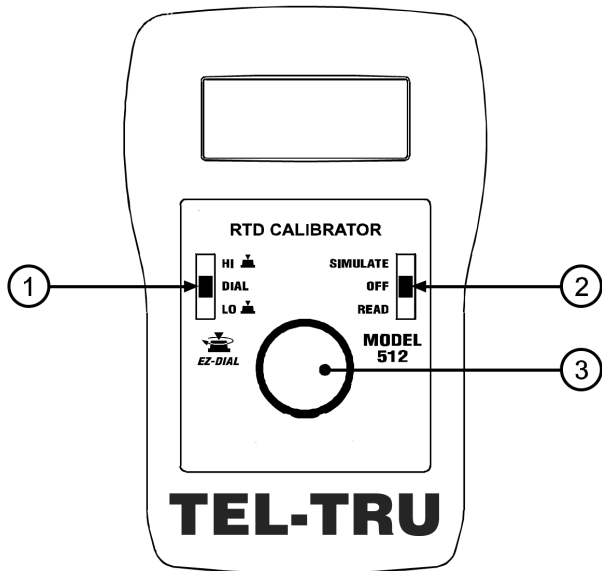
Tel-Tru Manufacturing Company
408 St. Paul St., Rochester, New York 14605 USA
Phone: 585.232.1440 • 800.232.5335 • Fax: 585.232.3857 • E-mail: info@teltru.com • Web: www.teltru.com





**Model 512
RTD Calibrator
Operating Instructions**

Basic Keypad Operations



① EZ-Check™ Switch

Slide the switch to select from three user stored values for the desired calibration points. The user can select HI, DIAL, and LO positions. These values can easily be changed to suit the calibration requirements.

② SIMULATE/OFF/READ Switch

Turn the Model 512 on to SIMULATE to output a resistance corresponding to temperature. Turn the unit to READ to read RTD resistance directly in temperature.

③ EZ-Dial™ Knob

Turn the knob to change temperature in 0.1° increments. Push and turn for faster dialing. Push without turning to store new EZ-Check HI/LO points in SIMULATE mode, or to clear EZ-Check HI/LO points in READ mode.

Model 512 Configuration

Instructions for Enabling and Disabling the Configuration Options

1. Turn the Model 512 on to SIMULATE or READ.
2. Press the EZ-Dial Knob while the "PRESS EZ-DIAL KNOB FOR CONFIGURATION" message is displayed.
3. Select options by turning the EZ-Dial Knob until the arrow points to the desired option.
4. The option can be enabled or disabled by tapping the EZ-Dial Knob.

The Model 512 configuration menu will exit automatically after 5 seconds of inactivity and go to normal operation with the options selected. These options are recalled at turn on until they are changed again.



Model 512 Configuration Menu

Auto Off **ON/OFF**

If Auto Off is ON, the unit will turn off after 30 minutes to save battery life, if there is no user activity. If Auto Off is OFF the unit will stay on until it is turned off from the keypad. This is typically useful for manual loading or continuous use.

Display Units **°C/°F**

Pressing the EZ-Dial Knob to toggles between °C or °F

RTD **Pt100/Pt1000 Ω=3850, Pt100 Ω=3902, Pt100 Ω=3916, Pt100 Ω=3926, Cu10 Ω=427, Ni110 Ω Bristol=5801, Ni120 Ω=672**

To change RTD type, press the EZ-Dial Knob. Turn the EZ-Dial Knob to scroll through the list of available types. Press again to save and return to the configuration menu.



Model 512 Operating Instructions

Read Mode

Slide the SIMULATE/OFF/READ switch to READ for direct RTD input. The Model 512 displays temperature corresponding to resistance input for the selected RTD type.

Automatic 2, 3, or 4 wire detect: Connect 2, 3, or 4 wires to the RTD sensor. Follow the connection diagrams. The Model 512 indicates "2W", "3W", or "4W" in the lower left corner of the display. Use this feature for troubleshooting broken leads or sensors.

Slide the EZ-Check Switch to HI and LO to recall maximum and minimum saved readings. Press and hold the EZ-Dial Knob to clear saved readings. The display flashes "CLEARED" as a confirmation.

Be sure the switch is in the DIAL position to monitor input. Observe the "HI" and "LO" switch position indicators in the display.

Double-click the EZ-Dial Knob to return to the configuration menu.

Turning the EZ-Dial Knob has no effect in read mode.

Display Indications:

- OVERRANGE** or **UNDERRANGE** The resistance input exceeds the range of the selected RTD type.
- OPEN RTD** No RTD is connected.
- MISCONNECT** The Model 512 is incorrectly connected for a 3-wire reading. Both black leads are required.

Source Mode

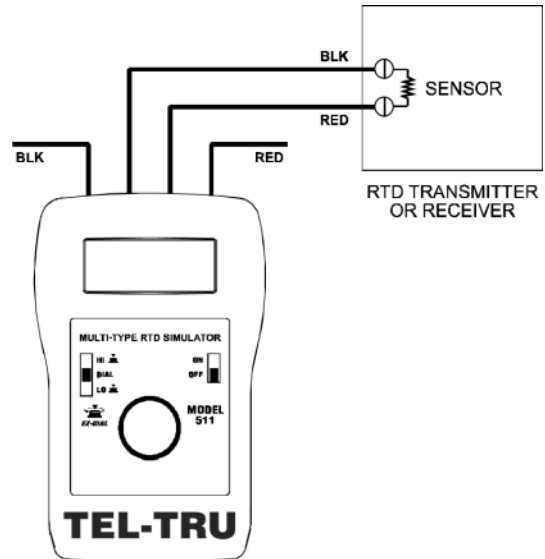
Slide the SIMULATE/OFF/READ switch to SIMULATE for direct RTD output. The Model 512 outputs resistance corresponding to temperature for the selected RTD type.

Turn the EZ-Dial Knob to change temperature, push and turn for faster dialing.

Slide the EZ-Check Switch to HI or LO to recall stored settings. While in the HI or LO position, dial a new setting and press the EZ-Dial Knob to store. The DIAL position always holds the last setting dialed there.

Double-click the EZ-Dial Knob to return to the configuration menu.

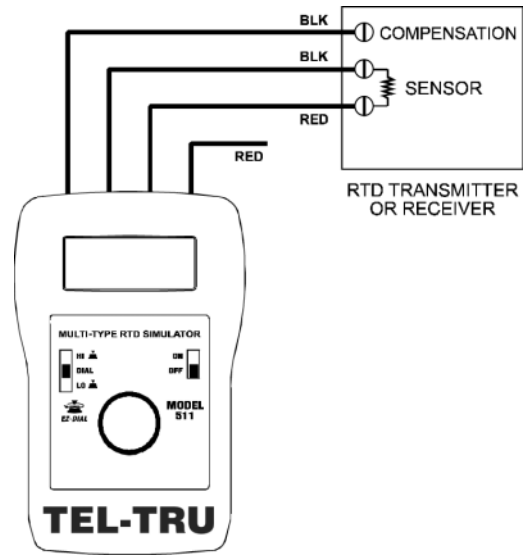
Connection Diagrams



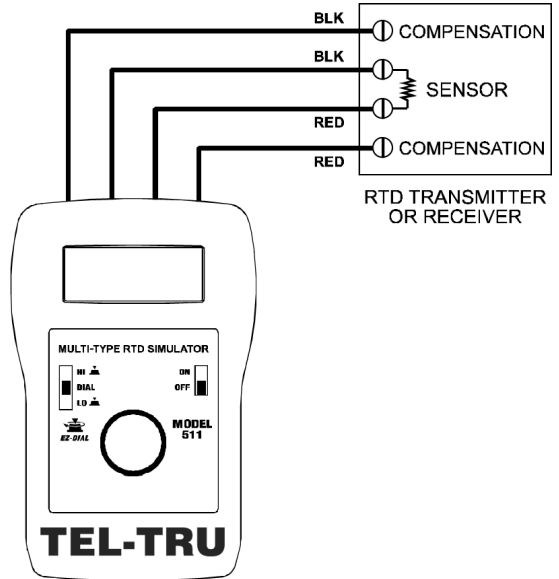
Two Wire Connection to Transmitter



Model 512 Operating Instructions



Three Wire Connection to Transmitter



Four Wire Connection to Transmitter



Model 512 Operating Instructions

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	0.00-410.00 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	±10 μV/Excitation Current (units are in Ω)
Pulsed Excitation Current Compatibility	DC to 0.01 second pulse widths

RTD Read Specifications:

Excitation Current	1.0 mA nominal
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Available Options:

Carrying Case	Part Number: 020-0201
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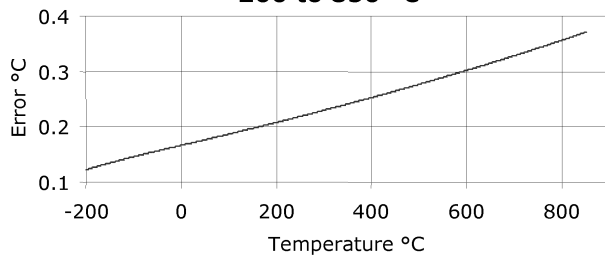


Model 512 Operating Instructions

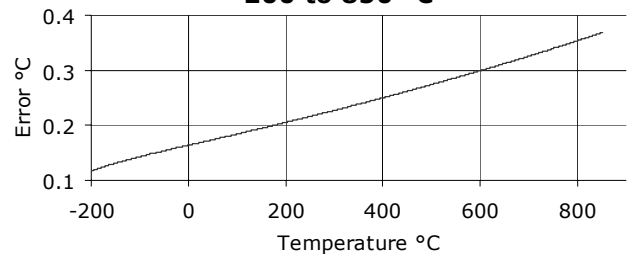
Temperature Accuracy

The following charts give worst-case temperature accuracy based on stated resistance accuracy of $\pm(0.015\% + 0.05)\Omega$.

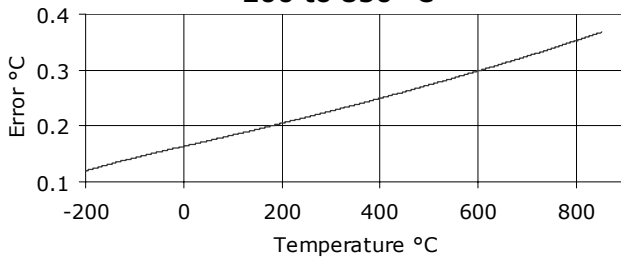
Pt100/1000 TCR=0.00385
-200 to 850 °C



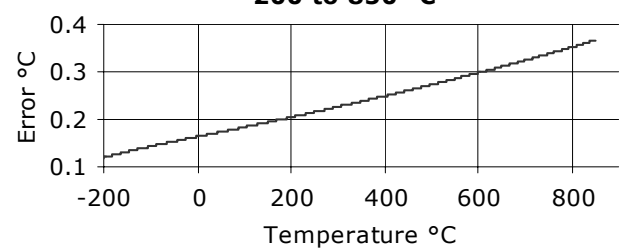
Pt100 TCR=0.003902
-200 to 850 °C



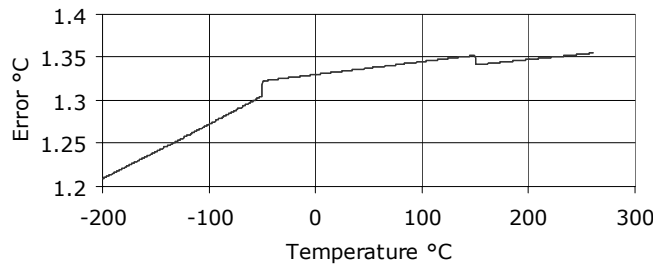
Pt100 TCR=0.003916
-200 to 850 °C



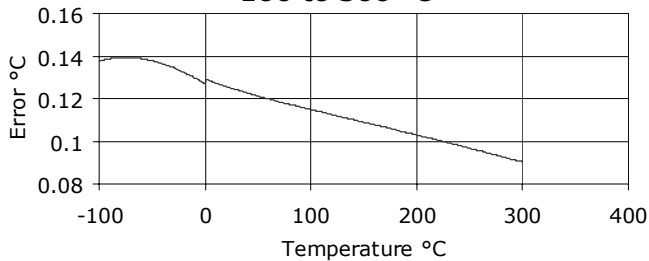
Pt100 TCR=0.003926
-200 to 850 °C



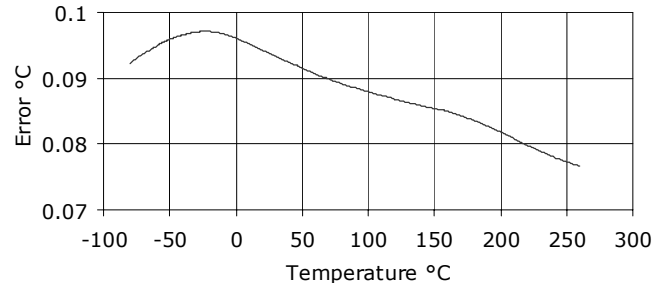
Cu10 TCR=0.00427
-200 to 260 °C



Ni110 TCR=0.00530
-100 to 300 °C



Ni120 TCR=0.00672
-80 to 260 °C





Model 512 Operating Instructions

EZ-Dial and EZ-Check are trademarks of Practical Instrument Electronics, Inc.

Warranty

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