



TEL-TRU MANUFACTURING COMPANY

MODEL 510 RTD SIMULATOR

Including Pt1000 Curve for use with Digi-Tel Temperature Transmitter

▶ FEATURES:

Simulate RTD Temperature Outputs

- Calibrate directly in temperature for your RTD curve
- Adjustable output for full temperature range
- Several Manufacturers' RTD Curves Available
- Platinum, Copper & Nickel

Accurate to $\pm 0.25^{\circ}\text{C}$ ($\pm 0.5^{\circ}\text{F}$)

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

EZ-Dial™ Knob

- Easily adjust output by 1°F
- 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 510 RTD Simulator simulates standard RTD curves over the entire industrial temperature range. Choose between eight standard RTD curves.

The Model 510 will simulate RTD resistances into all types of instruments such as transmitters, recorders, controllers, alarms, data acquisition, and computer systems. Rest easy knowing these calibrators are 100% compatible with pulsed systems and transmitters like the Rosemount 3144 Transmitter. The Model 510 is a superior replacement for decade boxes, so there is no need to lug a decade box around or be prone to error by reading RTD tables incorrectly. The Model 510 has better accuracy, functions and compatibility than many higher priced RTD calibrators.

The EZ-Check function allows the user to store three output temperatures for real convenience. This will save time for repetitive calibrations by instantly recalling the three stored temperature values. Three output settings can be stored, and all settings are saved, even with the power off.

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



Model pictured above:

Model 510 – Single Curve, 1° , selectable $^{\circ}\text{C}$ or $^{\circ}\text{F}$
(Pt100: $a = 1.3850, 1.3902, 1.3916, 1.3926$ and Cu10, Ni110, Ni120, Ω)
(Pt1000: $a = 1.3850$)

CE APPROVED!



World-Class Instruments

*Since
1916*

www.teltru.com

► 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), Non-condensing 10% ≤RH ≤70% (35 to 60°C), Non-condensing
Size	4.9 x 3.15 x 1.82" (125.5 x 80 x 46.2mm)
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 DC or AC peak up to 30 seconds in duration High contrast graphic liquid crystal display with 0.357" (9.07mm) high digits

► RTD CURVE SIMULATION SPECIFICATIONS:

(ITS-90 Curves)

Accuracy	±(0.015% of Setting in Ω + 0.05 Ω)
Typical accuracies for RTD curves are:	
Pt100/Pt1000	±0.25°C (±0.5°F)
Cu10	±1.5°C (±3°F)
Ni110, Ni 120Ω	±0.25°C (±0.5°F)
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
Output Dial Adjustment Resolution	1°C or 1°F Adjustment Resolution
Temperature Coefficient	±0.05 Ω/°C Ambient

► AVAILABLE OPTIONS:

Carrying Case	Part Number: 020-0201
----------------------	-----------------------

► ORDERING INFORMATION:

MODEL 510 - RTD Source (Single Type/1° resolution)

Order Code:	Model 510-Pt100-1 (α =1.3850)
	Model 510-Pt100-2 (α =1.3902)
	Model 510-Pt100-3 (α =1.3916)
	Model 510-Pt100-4 (α =1.3926)
	Model 510-Cu10
	Model 510-Ni110
	Model 510-Ni120
	Model 510-Pt1000 (α =1.3850, designed for use with Digi-Tel Temperature Transmitter)

► 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 may be returned to our factory, shipping charges prepaid, after notification to and authorization from us. 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





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.

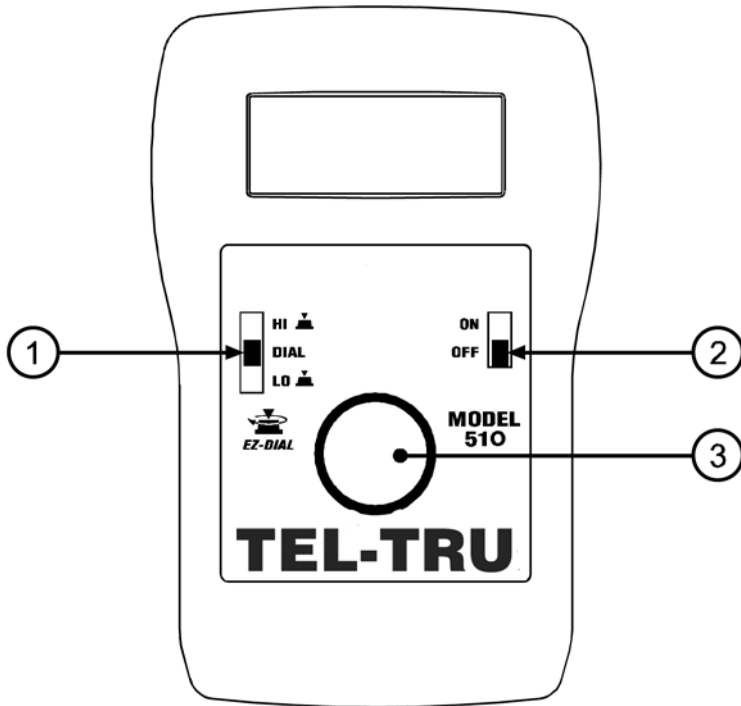
② **ON/OFF Switch**

Slide the **ON/OFF** to turn the Model 510 on or off.

③ **EZ-Dial™ Knob**

The **EZ-Dial Knob** has two adjustment speeds. Simply turning the **EZ-Dial Knob** will select fine adjustments. While pressing down and turning the **EZ-Dial Knob** will make course adjustments.

*Note: When the **EZ-Check Switch** is in the HI or LO position, pressing and holding the **EZ-Dial Knob** without turning will store a new HI or LO EZ-Check value.*



Model 510 Configuration

Instructions for Enabling and Disabling the Configuration Options

1. Turn the Model 510 on with the ON/OFF Switch ②.
2. Press the EZ-Dial Knob ③ 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 510 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 510 Operating Instructions

Model 510 Configuration

Model 510 Configuration Menu

Auto Off ON (default)/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 (default)/°F

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

RTD { rtd type }

Model 510: The RTD type is fixed as ordered from the factory and cannot be changed.

{ rtd type } is one of:
Pt100/Pt1000 $\Omega=3850$ (default), Pt100 $\Omega=3902$, Pt100 $\Omega=3916$, Pt100 $\Omega=3926$, Cu10 $\Omega=427$, Ni110 Ω Bristol=5801, Ni120 $\Omega=672$

EZ-Dial Knob

Turning the EZ-Dial Knob to adjust the output up or down. Fine adjustments can be made by turning the EZ-Dial Knob. Coarse adjustments can be made by pressing and turning the EZ-Dial. New values can be stored into the HI and LO EZ-Check positions by pressing down on the EZ-Dial Knob until "STORED" is indicated on the display.

EZ-Check Switch

The EZ-Check Switch has three positions: HI, DIAL, and LO. Its position is shown at the left edge of the display with "HI" and "LO" indicators. The output is adjustable in all three positions. The EZ-Check Switch allows user-selected values to be stored in the HI and LO positions when used in combination with the EZ-Dial Knob.

To store new EZ-Check value(s):

1. Dial the display to match the desired stored outputs for the HI or LO positions.
2. Press down on the EZ-Dial Knob until the confirmation message "STORED" appears.
3. Recall the values by moving the switch between HI, DIAL, and LO.

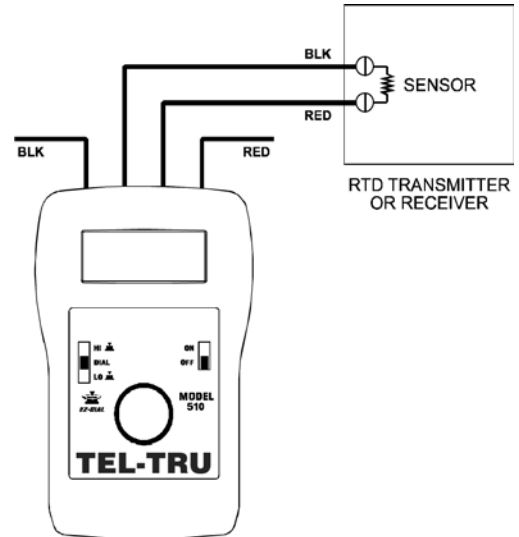
Operational description: When returning to previously set EZ-Check positions, the DIAL position always recalls the last output value it was dialed to. The HI and LO positions will recall the last STORED value, NOT the last output value it was last dialed to.

Hint: For faster calibrations, the product has been designed so the position of the switch can be felt. This tactile feature allows continuous monitoring of the device being calibrated without looking back at the Model 510 display. This is also useful in poor lighting or under difficult operating conditions.

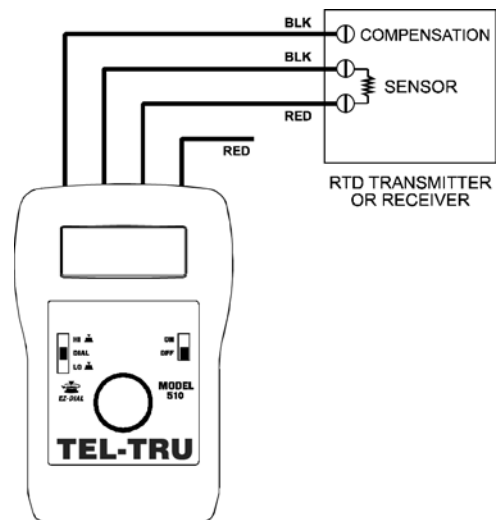


Model 510 Operating Instructions

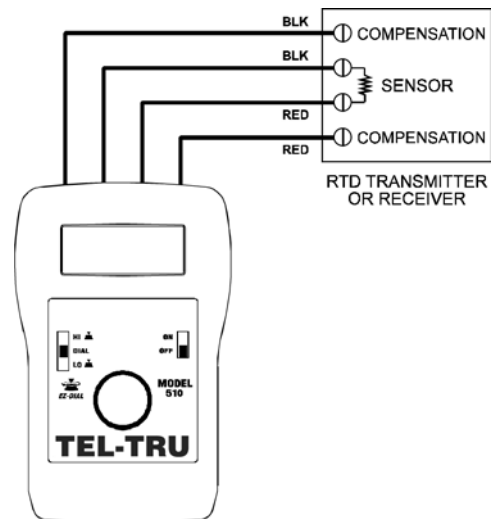
Connection Diagrams



Two Wire Connection to Transmitter



Three Wire Connection to Transmitter



Four Wire Connection to Transmitter



Model 510 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 DC or AC peak up to 30 seconds in duration High contrast graphic liquid crystal display with 0.357" (9.07 mm) high digits

RTD Curve Simulation Specifications (ITS-90 Curves):

Accuracy	±(0.015% of Setting in Ω + 0.05Ω)
Typical accuracies for RTD curves are:	
Pt100/Pt1000	±0.25°C (±0.5°F)
Cu10	±1.5°C (±3°F)
Ni110, Ni 120Ω	±0.25°C (±0.5°F)
Allowable Excitation Current for accuracies below 100μA add	100 μA to 10.2 mA, steady or pulsed/intermittent/smart ±10μV/Excitation Current (units are in Ω)
Pulsed Excitation Current	DC to 0.01 second pulse widths
Compatibility	
Output Dial Adjustment Resolution	1°C or 1°F Adjustment Resolution
Temperature Coefficient	±0.05Ω/°C Ambient

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

WARRANTY

Our equipment comes with a NIST traceable certificate and 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.