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WARNING: These products are not designed for use in, and should not be used for, human applications.



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **37 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **three (3) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

- 1. Purchase Order number under which the product was PURCHASED,
- 2. Model and serial number of the product under warranty, and
- 3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

- 1. Purchase Order number to cover the COST of the repair,
- 2. Model and serial number of the product, and
- 3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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M4960/1010



User's Guide



CL510A-1



CL510A-10

Shop online at



omega.com

e-mail: info@omega.com
For latest product manuals:
omegamannual.info



CL510A RTD Simulator

Accessories

Included:

Four "AA" Alkaline batteries, Certificate of Calibration
 RTD Wire Kit
 2 Red & 2 Black Leads with Retractable Shield Banana Plugs & Spade Lugs

Part Number

020-0208

Optional:

Rubber Boot
 Small Carrying Case
 Ni-MH 1 Hour Charger with 4 Ni-MH AA Batteries
 (100-120 V AC input for North America Only)

Part Number

CL500A-RB
 SC-HH500
 020-0103



More Than a Simple Boot

The optional boot provides more than just protection. Flip out the tilt stand and free up both hands for calibration adjustments.

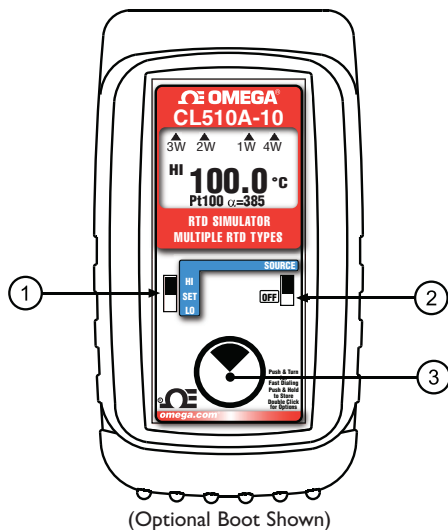


(Shown without optional boot)

Product Description

- Easy to use**
 With the Omega CL510A Series Simulator you can check & calibrate all your RTD instruments. Automatic indication of connections on the display for simple hookups. Choose a single RTD type for the Model CL510A or simulate 10 RTD types with the Model CL510-10.
- Take it without into the shop, plant or field**
 Carry it without worry - protect with an optional rubber boot and rugged, low profile switches. Easy to operate even in the dark areas of the plant with the backlit display.
- Calibrate directly in temperature (°C & °F)**
 Stop carrying around a decade box and RTD resistance tables. The Omega CL510A Series works with the RTDs you use including Platinum 100 (alpha = 3850, 3902, 3926) & 1000 (alpha = 3850, 3750) Ohm, Copper 10 & 50 Ohm, Nickel 100 and 120 Ohm. Easily set any value quickly to within 0.1° with the adjustable digital potentiometer "DIAL" plus store any three temperatures for instant recall with the "DIAL" switch.
- Compatible with all process instruments**
 Connect directly to the RTD inputs of smart transmitters, PLCs, DCS and multichannel recorders and verify their outputs or displays. Works with older instruments with fixed excitation currents and newer multichannel instruments that switch the excitation current between input channels.

Basic Operation



- **DIAL SWITCH**

SOURCE: Instantly output two preset RTD temperatures by moving the DIAL switch to the “LO” position or “HI” position. For fast three point checks select the “DIAL” position. The Omega CL510A will remember the last “DIAL” value, even with the power off.

These values can easily be changed to suit the calibration requirements.

- **SOURCE/OFF Switch**

Select “SOURCE” to output in °C, °F or ohms.

- **DIAL KNOB**

SOURCE: Turn the knob to adjust the output level. Turn clockwise to increase the output, counter clockwise to decrease the output in 0.1° steps at a time. Push down and turn the DIAL knob for faster dialing.

Press and hold the knob for two seconds to store desired DIAL HI/LO points in SIMULATE mode.

Double click the knob to get into the Omega CL510A Configuration Mode. Use configuration to select °C or °F, RTD Type (except CL510A-10) and Auto Off On/Off.

CHANGING BATTERIES

Low battery is indicated by “BAT” on the display. Approximately one to four hours of typical operation remain before the Omega CL510A Series will automatically turn off. To change the batteries; remove the optional rubber boot, remove the battery door from the back of the unit by sliding the door downward. This allows access to the battery compartment. Replace with four (4) ‘AA’ 1.5V batteries being careful to check the polarity. Replace the battery door and replace the boot. All stored configuration options (RTD Type, DIAL Memories, etc., are reset to factory settings when the batteries are removed.

Note: Alkaline batteries are supplied and recommended for maximum battery life and performance.

Additional Information

This product is calibrated on equipment traceable to NIST and includes a Certificate of Calibration. Omega Engineering recommends a calibration interval of one year.

OMEGA CL510A Specifications

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

General	
Accuracy	±(0.015% of Setting in Ohms + 0.05 Ohms)
Temperature Drift	± 0.05 Ohms/°C
Operating 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 With Boot	4.96 × 2.73 × 1.79 inches, 126 × 69 × 45 mm (L × W × H)
	5.67 × 3.06 × 2.05 inches, 144 × 78 × 52 mm (L × W × H)
Weight With Boot	8.4 ounces, 0.24 kg (including batteries)
	11 ounces, 0.32 kg (including batteries)
Batteries	Four "AA" Alkaline 1.5V (LR6)
Battery Life	50 Hours
Optional NiMh Rechargeable battery kit	120VAC for North America Only; charger, four NiMh batteries, AC & DC cords [Part # 020-0103]
Low Battery	Low battery indication with nominal 1 hour of operation left
Protection against misconnection	Over-voltage protection to 60V dc (rated for 30 seconds)
Display	High contrast graphic liquid crystal display. LED backlighting for use in low lit areas.

Source	
Accuracy From 1 to 10.2 mA External Excitation Current	±(0.015% of Setting + 0.05 Ohms)
	±(0.015% of Setting + $\frac{0.01 \text{ mV}}{\text{mA Excitation Current}} + 0.05 \text{ Ohms}$)
Resistance Ranges	0.00 to 410.00, 410.1 to 4001.0 Ohms
Allowable Excitation Current Range	<410 Ohms: 10.2 mA max; steady or pulsed/intermittent
	410 to 4001 Ohms: 1 mA max; steady or pulsed/intermittent
Pulsed Excitation Current Compatibility	DC to 0.01 second pulse width

Configuration

Configure the Calibrator

Move Ⓢ POWER SWITCH to "SOURCE".

**MODEL 51# V#.##
DOUBLE CLICK
DIAL KNOB
FOR CONFIGURATION**

Setup

Double click the Ⓢ DIAL KNOB at any time the unit is on and the following displays will appear for 15 seconds:

> **EXIT** 15
TEMP UNITS °C
RTD Pt 100 α=3850
AUTO OFF ON

Turn the Ⓢ DIAL KNOB to move through the menu. Press the Ⓢ DIAL KNOB to toggle between OFF and ON or to scroll through the settings.

EXIT MENU - exits this menu immediately and saves any changes. Menu will automatically exit after 15 seconds of inactivity (countdown timer is displayed).

TEMP UNITS - pressing the knob will toggle between °C and °F.

RTD -

510: pressing the knob will toggle between the factory configured RTD (Pt, Cu & Ni) and Ohms.

511: pressing the knob will cycle through the ten different RTD types (Pt, Cu & Ni) at different base resistances and alpha values and Ohms.

AUTO OFF - If AUTO OFF is ON, the unit will turn off after 30 minutes of inactivity to save battery life. If AUTO OFF is OFF the unit will stay on until the POWER SWITCH is moved to the off position.

Note: All settings are remembered even with the power off. Removing the batteries resets the values to factory defaults.

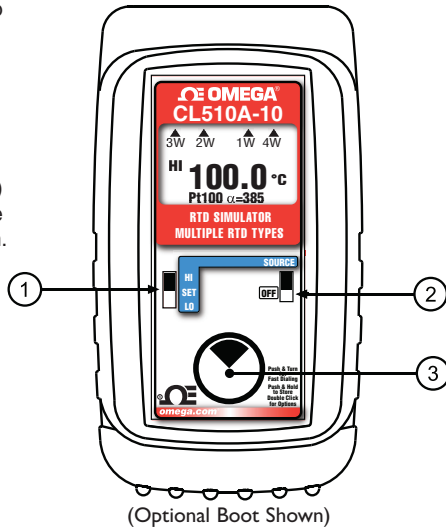
Calibrating RTD Instruments

SOURCE

Choose this function to provide a simulated RTD signal into controllers, temperature transmitters, indicators or any input devices that measure thermocouple sensors.

- 1) Disconnect the RTD sensor from the device to be calibrated.
- 2) Select "**SOURCE**" with slide switch ②.
- 3) Connect the meter to the device using 2, 3 or 4 wires matching the connections of the sensor that was just removed.

The output is adjusted in 0.1° (or 0.01/0.1 ohm) increments by turning the knob ③ while the DIAL switch ① is in the "HI", "LO" or "SET" position. Press and turn the knob for faster dialing with 10° (or 1.00/10.0 ohm) increments.



(Optional Boot Shown)

STORED appears to store the value. Release the DIAL knob.

Storing DIAL Outputs

STORING HI and LO DIAL Outputs

Choose this function to provide a simulated RTD signal into controllers, temperature transmitters, indicators or any other input device that measure thermocouple sensors..

- 1) Store your high (SPAN) output temperature by moving the DIAL switch to the **HI** position and turn the ③ DIAL knob until the desired temperature is on the display. Press and hold the DIAL knob until **STORED** appears to store the value. Release the DIAL knob.
- 2) Store your low (ZERO) output temperature by moving the DIAL switch to the **LO** position and turn the ③ DIAL knob until the desired temperature is on the display. Press and hold the DIAL knob until **STORED** appears to store the value. Release the DIAL knob.
- 3) Instantly output your SPAN and ZERO temperature outputs by moving the DIAL switch between HI and LO. You may also select any third temperature output (such as mid-range) using the SET position on the DIAL switch.

Ranges & Accuracies

RTD Type	Alpha	Degrees C Range	Accuracy °C	Degrees F Range	Accuracy °F
Pt 100 Ohm (DIN/IEC/JIS 1989) Based on ITS-90	1.3850 (0.00385)	-200.0 to 200.0 200.0 to 600.0 600.0 to 850.0	±0.2° ±0.3° ±0.4°	-328.0 to 392.0 392.0 to 1112.0 1112.0 to 1562.0	±0.4° ±0.6° ±0.7°
Pt 100 Ohm (Burns)	1.3902 (0.003902)	-195.6 to 200.0 200.0 to 648.9	±0.2° ±0.3°	-320.0 to 392.0 392.0 to 1200	±0.4° ±0.6°
Pt 100 Ohm (Old JIS 1981)	1.3916 (0.003916)	-200.0 to 200.0 200.0 to 648.9	±0.2° ±0.3°	-328.0 to 392.0 392.0 to 1200	±0.4° ±0.6°
Pt 100 Ohm (US Lab)	1.3926 (0.003926)	-200.0 to 100.0 100.0 to 700.0 700.0 to 850.0	±0.2° ±0.3° ±0.4°	-328.0 to 212.0 212.0 to 1292.0 1292.0 to 1562.0	±0.4° ±0.6° ±0.7°
Pt 1000 Ohm (DIN/IEC/JIS 1989)	1.3850 (0.00385)	-200.0 to 200.0 200.0 to 600.0 600.0 to 850.0	±0.2° ±0.3° ±0.4°	-328.0 to 392.0 392.0 to 1112.0 1112.0 to 1562.0	±0.4° ±0.6° ±0.7°
Pt 1000 Ohm Hy-Cal HVAC	1.3750 (0.00375)	-200.0 to 200.0 200.0 to 600.0 600.0 to 850.0	±0.2° ±0.3° ±0.4°	-328.0 to 392.0 392.0 to 1112.0 1112.0 to 1562.0	±0.4° ±0.6° ±0.7°
Copper 10 Ohm (Minco)	1.4274 (0.004274)	-200.0 to 260.0	±2.0°	-328.0 to 500.0	±4.0°
Copper 50 Ohm	1.4280 (0.00428)	-50.0 to 150.0	±1.0°	-58.0 to 302.0	±1.6°
Ni 120 Ohm (Pure)	1.6720 (0.00672)	-80.0 to 260.0	±0.1°	-112.0 to 500.0	±0.2°
Ni 110 (Bristol 7 NA)	1.5801 (0.005801)	-100.0 to 260.0	±0.2°	-148.0 to 500.0	±0.3°