

# Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!



## User's Guide



<http://www.omega.com>  
e-mail: [info@omega.com](mailto:info@omega.com)



## CL210 Hand-Held Voltage Calibrator

OMEGAnet™ On-Line Service <a href="http://www.omega.com">http://www.omega.com</a>	Internet e-mail <a href="mailto:info@omega.com">info@omega.com</a>
--	---

### Servicing North America:

USA: ISO 9001 Certified  
One Omega Drive, Box 4047  
Stamford, CT 06907-0047  
Tel: (203) 359-1660  
FAX: (203) 359-7700  
e-mail: [info@omega.com](mailto:info@omega.com)

Canada:  
976 Bergar  
Laval (Quebec) H7L 5A1  
Tel: (514) 856-6928  
FAX: (514) 856-6886  
e-mail: [canada@omega.com](mailto:canada@omega.com)

### For immediate technical or application assistance:

USA and Canada:  
Sales Service: 1-800-826-6342 / 1-800-TC-OMEGA™  
Customer Service: 1-800-622-2378 / 1-800-622-BEST™  
Engineering Service: 1-800-872-9436 /  
1-800-USA-WHEN™  
TELEX: 996404 EASYLINK: 629688934  
CABLE: OMEGA

Mexico and Latin America:  
Tel: (95) 800-TC-OMEGA™  
FAX: (95) 203-359-7807  
En Español: (203) 359-7803  
e-mail: [espanol@omega.com](mailto:espanol@omega.com)

### Servicing Europe:

**Benelux:**  
Postbus 8034, 1180 LA Amstelveen,  
The Netherlands  
Tel: (31) 20 6418405 FAX: (31) 20 6434643  
Toll Free in Benelux: 06 0993344  
e-mail: [nl@omega.com](mailto:nl@omega.com)

**Germany/Austria:**  
Daimlerstrasse 26, D-75392  
Deckenpfronn, Germany  
Tel: 49 (07056) 3017 FAX: 49 (07056) 8540  
Toll Free in Germany: 0130 11 21 66  
e-mail: [germany@omega.com](mailto:germany@omega.com)

**Czech Republic:**  
ul. Rude armady 1868, 733 01 Karvina-Hranice,  
Czech Republic  
Tel: 420 (69) 6311627 FAX: 420 (69) 6311114  
e-mail: [czech@omega.com](mailto:czech@omega.com)

**United Kingdom: ISO 9002 Certified**  
• 25 Swannington Road, Broughton  
Astley, Leicestershire, LE9 6TU,  
England  
Tel: 44 (1455) 285520  
FAX: 44 (1455) 283912  
• P.O. Box 7, Omega Drive, Irlam,  
Manchester, M44 5EX, England  
Tel: 44 (161) 777-6611  
FAX: 44 (161) 777-6622

**France:**  
9, rue Denis Papin, 78190 Trappes  
Tel: (33) 130-621-400 FAX: (33) 130-699-120  
Toll Free in France: 0800-4-06342  
e-mail: [france@omega.com](mailto:france@omega.com)

Toll Free in England: 0800-488-488  
e-mail: [uk@omega.com](mailto:uk@omega.com)

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

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



## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, 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 being damaged as a result of excessive corrosion, or current, heat, moisture or vibration; improper specification; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and traces.

**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 it 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. P.O. 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. P.O. number to cover the COST of the repair,
2. Model and serial number of 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. OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 1996 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without prior written consent of OMEGA ENGINEERING, INC.

- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

### DATA ACQUISITION

- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

### HEATERS

- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

### ENVIRONMENTAL MONITORING AND CONTROL

- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

### TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

### PRESSURE, STRAIN AND FORCE

- Transducers & Strain Gauges
- Load Cells & Pressure Gauges
- Displacement Transducers
- Instrumentation & Accessories

### FLOW/LEVEL

- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

### pH/CONDUCTIVITY

- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters

M3123/0798

## GENERAL DESCRIPTION

The CL210 is designed to be a complete process voltage calibrator delivering high accuracy in a small easy to use package. Its microprocessor based circuitry makes it a snap to select a voltage output or input range and make large or small output changes without unnecessary complexity.

Voltage can be sourced or read on two ranges, either 100 millivolts or 10 volts.

When operated in the Source mode the Step and Scroll keys allow the user to make both large and small incremental output changes quickly to expedite a calibration routine.

## INSTALLATION

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call Omega's Customer Service Dept. at 1-800-826-6342.

When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

**NOTE:** The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

## SET-UP

Before beginning, become familiar with the keypad layout and the configuration of the input/output jacks. Remember, these jacks are used in multiple configurations so pay careful attention to how the test leads are connected for the specific application.

## OPERATING PROCEDURE

1. Turn on power and select either the Input or Output mode.
2. Press the Range key to select either the 10 volt or 100 millivolt range.
3. Connections are the same for both input or output modes of operation. The black jack is negative (-) and the red jack is positive (+).
4. When operated in the Source mode, the Step and Scroll keys are used to set one desired output. Use the Step key to make large changes and the Scroll key for smaller changes. Holding the Scroll key for several seconds will cause the scroll rate to speed up, facilitating adjustments among the stepped outputs.

## OPERATING MODES

1. When operating in the Voltage Source mode the CL210 can drive loads accurately up to 1mA. The maximum current drive is approximately 20 mA at reduced accuracy.

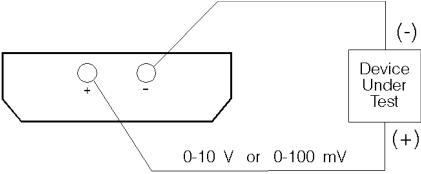


FIGURE 1 - Voltage Source Mode

2. The CL210 can also be used to accurately read DC voltages on either the 100 millivolt or 10 volt ranges as shown in Figure 2.

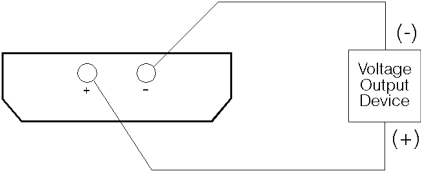


FIGURE 2 - Reading a Voltage Input

**NOTE:** If the input voltage being read exceeds 25 volts the input protection circuit will be activated and the internal fuse may blow. Contact Martel if this is suspected.

## ACCURACY

The CL210 is checked against an NIST traceable reference before shipment to verify that each range falls within its 0.025%,  $\pm 1$  LSD specification.

Long term accuracy (beyond 1 year) should remain within 0.05%,  $\pm 1$  LSD. All of these ratings are based on a 25°C ambient temperature. Therefore, allowances must be made for error caused by wide temperature variations.

## SPECIFICATIONS

<b>Input/output Ranges</b>	0.00 to 10.00 Volts 000.0 to 100.0 mV
<b>Accuracy</b>	$\pm 0.025\%$ $\pm 1$ LSD
<b>Maximum Load Driving</b>	1mA
<b>Operating Modes</b>	Read or Source
<b>Operating Temperature</b>	0 to 50°C
<b>Storage Temperature</b>	-20 to 60°C
<b>Temperature Stability</b>	.01% F.S./°C
<b>Power</b> <sup>1</sup>	9V Alkaline Battery
<b>Case Size</b>	1.43" x 3.15" x 5.7"
<b>Weight</b>	12 oz.

Notes: <sup>1</sup> A low battery indication is given at 5.5 volts.

## MAINTENANCE

Generally, with normal usage, this calibrator should hold its rated specifications for at least 12 months. Beyond this, it should remain within 1.5X of its specification over its useful life, provided it is not abused or tampered with. If after the stated warranty period, the device falls out of calibration, it can be returned to Omega for re-calibration. Please call 1-800-826-6342 for pricing and return information.