

# PORTABLE DOCUMENTING CALIBRATOR

Available on select models



CLD-II  
**\$3235**



- ✓ **Simulates and Reads RTDs and Thermocouples**
- ✓ **Sources and Reads Millivolts, Volts, Milliamps, Ohms, and Frequency**
- ✓ **Measures Pressure from -14.7 to 10,000 psi**
- ✓ **Simultaneously Measures and Sources**
- ✓ **Data Storage for Field Calibrations**
- ✓ **Data Transfer Via RS232 or PCMCIA Card**
- ✓ **Input/Output Isolation**
- ✓ **Multilingual Menu: English, French, German, Italian, Portuguese, and Spanish**
- ✓ **24 V Self-Excitation for Transmitter Calibrations**

The CLD-II represents OMEGA's experience with designing portable multifunction calibrators.

This self-contained, battery-powered instrument simulates and measures RTDs, thermocouples, and resistance, and sources and reads milliamps, millivolts, volts, and frequency. An impact-resistant enclosure is fastened to the carrying case for safety. Alphanumeric and documenting keypads surround a large LCD panel with dual readout and backlight. Connectors for source and measure are on the bottom and top, respectively, and a 24 V output is provided for loop power. The CLD-II also measures pressure by connecting to OMEGA® pressure sensors.

This highly accurate and easy-to-use documenting calibrator provides improved data quality and quicker calibration time, since data can be uploaded and downloaded via the PCMCIA card or the RS232 interface.

**Typical Accuracies:** 0.01% rdg ±0.01% FS for mA measurement, 0.05% FS for pressure measurement

**Measure:** mA, mV, V, thermocouples, RTDs, pressure, ohms, frequency and switch state.

**Source:** mA, mV, V, thermocouples, RTDs, ohms and frequency

**Remote Pressure Sensors:** 1 to 10,000 psi, including gage, absolute and differential

**Loop Power:** 24 Vdc

**Data Storage Option:** PCMCIA cards types 1 or 2. Data may be transferred by RS232 or PCMCIA card after one-time activation with software release key provided on 1 MB card. After release, the 1 MB card or others of higher capacity may be used.

**Data Transfer:** RS232 or PCMCIA card

**Simple to Operate**

The key to the simple operation of the CLD-II is the structured menu. Input and output readings are displayed simultaneously for test modes such as T-I and P-I, allowing quick comparison of the values. Used in conjunction with other calibration software, the CLD-II will perform automatic calibrations from pre-defined procedures, calculating and reporting errors to the operator and storing the results on a PCMCIA card. This intuitive approach, whether used manually or automatically, ensures correct setup for the job at hand and improves efficiency and data accuracy.

The CLD-II provides simple and flexible data transfer. Information can be reviewed on screen or transferred to and from the CLD-II by using the RS232 interface. Alternatively, without docking the instrument to a PC, data can be transferred by exchanging PCMCIA cards.

The operating system works in several languages and provides scaling, step, and ramp features for calibration and maintenance. The CLD-II, which includes extensive self-test routines, can be relied on time and time again for field calibration in extreme conditions.

### Multifunction Portable Calibrator

Although designed for ease of use, the CLD-II meets a wide range of application needs, including calibration, maintenance, and commissioning. The dual display shows the measured and sourced values in large, clear digits, along with all applicable information such as units of measurement and range. The safe shoulder strap allows hands-free operation while maintaining display visibility.

### Temperature Sensor Simulation and Loop Checking

The auto step and ramp modes enable a single technician to test and commission control loops. The calibrator generates a pre-programmed output while the technician checks the signal further down the loop.

Simulating a temperature signal at the start of the loop, this instrument can check end-to-end control loop performance.

When troubleshooting, apply a 3-step approach.

**Step 1:** Measure the sensor output to confirm correct connection and operation.

**Step 2:** Check and calibrate the transmitter by simulating temperature signals and measuring the corresponding mA outputs.

**Step 3:** Feed the loop with an mA signal, and check wiring and instrumentation further down the line.

### Temperature Transmitter Simulation and Calibration

Direct connection of thermocouple compensation wires eliminates the need for special connectors and reduces additional cold-junction errors. This is the most reliable and accurate method of monitoring cold-junction temperatures in a portable field calibrator.

In calibration mode, the display shows all the required information. Both mV and mA values are displayed in °F for easy comparison, along with the calculated error expressed as a % of span or reading.



### Capabilities:

- ✓ Measure/Source mA
- ✓ Measure/Simulate 12 Types of T/C
- ✓ Measure/Simulate 9 Types of RTD
- ✓ Measure/Source Frequency and Pulses
- ✓ Simulate Transmitter Input and Measure Transmitter Output
- ✓ Measure/Source mV/V
- ✓ Measure/Source Resistance
- ✓ Measure Pressure: -14.7 to 10,000 psi
- ✓ Test Switches: Captures Values on Contact Change

The easy-to-operate menu-driven software enables the calibrator to be set up very quickly. Simply scroll through the menus and select the appropriate parameters.

Operating and connection errors, such as loop resistance mismatch and cold junction temperature sensor absence, are reported. The keystroking memory enables instant recall of previously stored user tests. The CLD-II will simulate the temperature signal to the transmitter to be calibrated and will simultaneously measure and display the output. A 24 V power supply is provided for stand-alone operation.

### Calibration for ISO 9000

Dedicated keys for documenting field calibrations eliminate human errors. The "AS FND" (as found) and "AS LEFT" keys start the respective procedures for storing calibration data, which can be recalled by pushing the "VIEW" key.

Optional PCMCIA cards represent the most efficient data transfer medium. Docking of the calibrator with the PC is unnecessary, since a card containing calibration data can be exchanged for another card that

contains new procedures/work orders, enabling technicians and calibrators to spend more time in the field.

Data is transferred to the PC from the PCMCIA card or the RS232 interface for analysis, certificate printing, and archiving. Exporting facilities are provided for word processor and spreadsheet applications or in-house maintenance systems.

### Remote Pressure Sensors

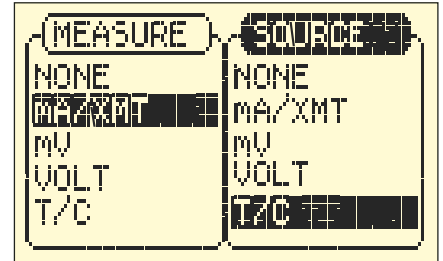
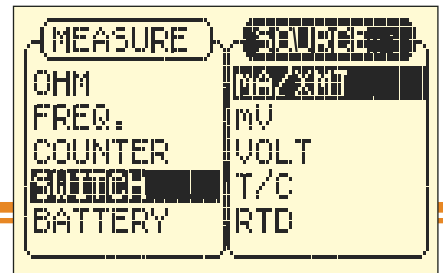
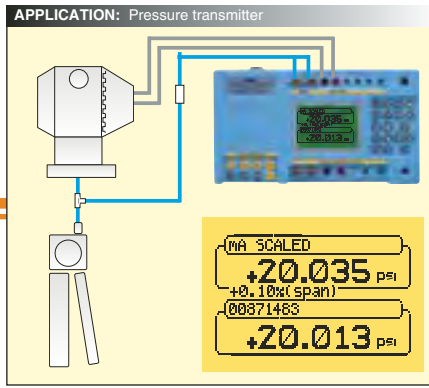
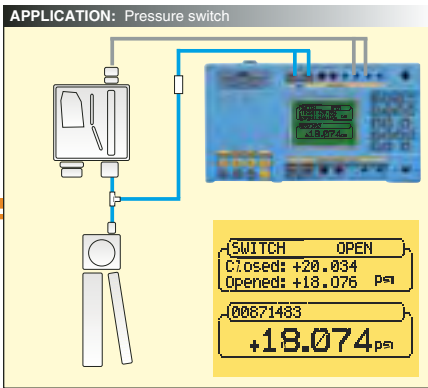
Remote pressure sensors offer a cost-effective means of expanding the capabilities of the CLD-II—for example:

- ✓ Calibration of Pressure Transmitters
- ✓ Testing Pressure Switches
- ✓ Differential Pressure Applications
- ✓ Flow Measurement Calibrations

Up to 8 external pressure sensors (connected one at a time) can be added. With ranges from 1 to 10,000 psi and all-welded stainless steel and Hastelloy construction, sensors can be chosen to suit many applications. Remote pressure sensors require a mating cable of approximately 4.5'. One end connection interfaces with the remote pressure sensor electrical input and one end mates with the CLD-II remote pressure sensor electrical input. OMEGA has applied the latest technology and production techniques to develop these sensors, which are digitally corrected for non-linearity and temperature effects.

### SPECIFICATIONS

Over 50 sensor ranges are available, in gage, absolute, and differential pressure types. With accuracy better than 0.05% FS, even the most up-to-date pressure instrumentation can be maintained and calibrated.



## SPECIFICATIONS

Temperature Units: °F or °C

Temperature scales:

IPTS68 or ITS90 selectable

Pressure Units: 15 units

Step: 10 programmable, 10%, 20%, 25%; manual step or adjustable timer

Ramp: Fully programmable travel time (up/down and dwell)

Scaling: 5 digits and sign on all electrical ranges

Temperature Transmitter Calibration:

Both input and output readings in temperature units; calibration feature extended for all output functions

Temperature Transmitter Simulation: mA output reads in temperature units

Signal Converter: Converts any input into any output, fully isolated

Keystroking: Storage for 9 user-defined test configurations

Switch Test: Display freezes on open and closed with switch resistance measurement

Data Log: PCMCIA card type 1 or 2

Languages: English, French, German, Italian, Portuguese and Spanish

Power Management: Auto backlight OFF, low-battery indicator and status from menu

DISPLAY

Panel: 66 x 41 mm (2.6 x 1.6") graphic LCD with backlight

Readout: Typically 5 readings per second

ENVIRONMENTAL

Calibration Reference:

22 ±1°C (72 ±2°F), RH 45 ±10%

Accuracies: Accuracies true for 16 to 27°C (60 to 80°F). Outside these limits add 0.0003%/°F typically

Operating Temperature:

-9 to 49°C (15 to 120°F)

Relative Humidity:

0 to 90%, non-condensing

Sealing: Generally to NEMA 12 (IP53)

Conformity:

EN50081-1, EN50082-1, CE Marked

Weight: 1.20 kg (2.65 lb)

Dimensions: 210 W x 121 H x 51 D mm (8.25 x 4.75 x 2.0")

Power: 4 "C" batteries or four 1.2 V Ni-Cad cells

RTD	RANGE		ACCURACY				RESOLUTION	
	°C	°F	MEASURE		SOURCE		°C	°F
Pt1000 <sup>1</sup>	-200 to 399	-328 to 752	0.5	0.9	0.5	0.9	0.1	0.2
Pt500 <sup>1</sup>	-200 to 849	-328 to 1562	0.4	0.7	0.4	0.7	0.1	0.2
Pt200 <sup>1</sup>	-200 to 849	-328 to 1562	0.6	1.1	0.6	1.1	0.1	0.2
Pt100 <sup>1</sup>	-200 to 849	-328 to 1562	0.3	0.6	0.3	0.6	0.033	0.06
Pt50 <sup>1</sup>	-200 to 849	-328 to 1562	0.5	0.9	0.5	0.9	0.036	0.02
D-100 <sup>2</sup>	-200 to 628	-328 to 1166	0.3	0.6	0.3	0.6	0.033	0.06
Ni100 <sup>3</sup>	-60 to 250	-76 to 482	0.2	0.4	0.2	0.4	0.1	0.2
Ni120 <sup>4</sup>	-80 to 260	-112 to 500	0.3	0.4	0.3	0.4	0.1	0.2
Cu10 <sup>5</sup>	-200 to 260	-328 to 500	2.0	3.6	2.0	3.6	0.3	0.6

1 = IEC 751, 2 = JIS 1604-1989, 3 = DIN 43760, 4 = MINCO 7, 5 = MINCO 16-9.

T/C	RANGE		ACCURACY				RESOLUTION	
	°C	°F	MEASURE		SOURCE		°C	°F
J <sup>1</sup>	-210 to 1199	-346 to 2192	0.3	0.6	0.2	0.4	0.1	0.2
L <sup>2</sup>	-200 to 899	-328 to 1652	0.3	0.6	0.2	0.4	0.1	0.2
K <sup>1</sup>	-250 to 1369	-418 to 2498	0.3	0.6	0.2	0.4	0.1	0.2
T <sup>1</sup>	-250 to 399	-418 to 752	0.3	0.6	0.2	0.4	0.1	0.2
E <sup>1</sup>	-250 to 999	-418 to 1832	0.3	0.6	0.2	0.4	0.1	0.2
N <sup>1</sup>	-200 to 1299	-328 to 2372	0.6	1.1	0.3	0.6	0.1	0.2
R <sup>1</sup>	-50 to 1770	-58 to 3214	1.0	1.8	0.5	0.9	0.1	0.2
S <sup>1</sup>	-50 to 1770	-58 to 3214	1.1	2.0	0.72	1.3	0.1	0.2
U <sup>2</sup>	-200 to 600	-328 to 1112	0.3	0.6	0.2	0.4	0.1	0.2
B <sup>1</sup>	250 to 1817	482 to 3308	0.94	1.7	0.72	1.3	0.2	0.4
C <sup>1</sup>	0 to 2318	32 to 4208	0.72	1.3	0.6	1.1	0.1	0.2
D <sup>1</sup>	0 to 2495	32 to 4523	1.0	1.8	0.5	0.9	0.2	0.4

1 = IEC 584, 2 = DIN 43710.

Note: Thermocouple accuracies do not include cold-junction compensation errors. The cold-junction compensation error is: ±0.2°C (±0.4°F) at reference conditions.



OUTPUT	RANGE	ACCURACY		RESOLUTION	REMARKS
		% OF READING	% OF RANGE		
mV	0 to 100 mV	0.02	+	0.01	Input > 20 MΩ
	100 to 600 mV	0.025	+	0.005	
V	0 to 6 V	0.025	+	0.005	Input > 1 MΩ
	6 to 60 V	0.05	+	0.005	
mA	0 to 52 mA	0.01	+	0.01	Input 2.5 Ω fused
Ohms	0 to 400 Ω	0.005	+	0.02	At 0.9 mA excitation
	400 to 2000 Ω	0.02	+	0.015	
Frequency	0 to 655 Hz			0.01	Input > 300 kΩ
	655 to 1310 Hz			0.1	Input > 300 kΩ
	1310 to 20,000 Hz			1	Input > 300 kΩ
Counts/Minute	0 to 6 x 10 <sup>5</sup>			1	Input > 300 kΩ
Counts/Hour	0 to 10 <sup>7</sup> -1			1	Input > 300 kΩ
Totalizing Counter	0 to 10 <sup>8</sup> -1	2 counts		Infinite	Ω Input > 300 k

OUTPUT	RANGE	ACCURACY		RESOLUTION	REMARKS
		% OF READING	% OF RANGE		
mV	-10 to 100 mV	0.01	+	0.005	Output < 0.2 Ω
V	0 to 12 V	0.01	+	0.005	Output < 0.2 Ω
mA	0 to 24 mA	0.01	+	0.02	Max 900 Ω
Ohms	0 to 400 Ω	0.005	+	0.02	At 1 mA excitation
	400 to 2000 Ω	0.02	+	0.015	
Pulse	0 to 10 <sup>8</sup> -1	Infinite		1	Input > 300 KΩ
Frequency	0 to 100 Hz			0.01	0 to 24 V/34 mA max
	0 to 20,000 Hz			1	0 to 24 V/34 mA max
Pulses/Minute	0 to 6000			1	0 to 24 V/34 mA max
Pulses/Hour	0 to 99,999			1	0 to 24 V/34 mA max

**AVAILABLE FOR FAST DELIVERY!**

To Order (Specify Model Number)		
MODEL NO.	PRICE	DESCRIPTION
CLD-II	\$3235	Portable multifunction calibrator
ACCESSORIES		
CLD-CHARGE	\$175	Charger/power supply 110 V
CLD-CHARGE-220V	180	Charger/power supply 220 V
CLD-II-LEADS	135	Set of test leads
CLD-MOD-(RANGE) <sup>†</sup>	920*	Pressure module (calibrated to CLD-II)
CLD-MOD-CABLE	105	Cable for external pressure module (required); only one module connected at a time to CLD-II

\* Add \$230 for pressure ranges below 5 psi or over 1000 psi. G = Gage, A = Absolute.

<sup>†</sup> CLD-MOD-(RANGE) modules must be ordered with CLD-II unit because they need to be calibrated with the unit.

Comes with carrying case, "C" batteries, set of test leads, connection module and complete operator's manual.

**Ordering Example:** CLD-II, portable multifunction calibrator, CLD-MOD-100G, external pressure module 100 psi gage, CLD-MOD-CABLE, cable for module, and CLD-II-LEADS, test leads, \$3235 + 920 + 105 + 135 = \$4395.

**†Pressure ranges  
[for CLD-MOD-(RANGE from below)  
and G, A as appropriate]**

Gage	Absolute
1 psi	5 psi
2.5 psi	10 psi
3 psi	15 psi
5 psi	20 psi
10 psi	30 psi
15 psi	50 psi
20 psi	75 psi
30 psi	100 psi
50 psi	150 psi
75 psi	200 psi
100 psi	300 psi
150 psi	450 psi
200 psi	500 psi
300 psi	600 psi
450 psi	1000 psi
500 psi	
600 psi	
1000 psi	
1500 psi	
2000 psi	
2500 psi	
3000 psi	
5000 psi	
6000 psi	
10000 psi	

**Comments:**  
Maximum line pressure 500 psi  
**Pressure connection:** ¼ FNPT  
**Note 1:** All gage ranges up to 500 psi are compound ranges  
**Note 2:** Absolute up to 1000 psi



#### UNITED STATES

[www.omega.com](http://www.omega.com)  
1-800-TC-OMEGA  
Stamford, CT.

#### CANADA

[www.omega.ca](http://www.omega.ca)  
Laval(Quebec)  
1-800-TC-OMEGA

#### GERMANY

[www.omega.de](http://www.omega.de)  
Deckenpfronn, Germany  
0800-8266342

#### UNITED KINGDOM

[www.omega.co.uk](http://www.omega.co.uk)  
Manchester, England  
0800-488-488

#### FRANCE

[www.omega.fr](http://www.omega.fr)  
Guyancourt, France  
088-466-342

#### CZECH REPUBLIC

[www.omegaeng.cz](http://www.omegaeng.cz)  
Karviná, Czech Republic  
596-311-899

#### BENELUX

[www.omega.nl](http://www.omega.nl)  
Amstelveen, NL  
0800-099-33-44



## More than 100,000 Products Available!

### • Temperature

Calibrators, Connectors, General Test and Measurement Instruments, Glass Bulb Thermometers, Handheld Instruments for Temperature Measurement, Ice Point References, Indicating Labels, Crayons, Cements and Lacquers, Infrared Temperature Measurement Instruments, Recorders Relative Humidity Measurement Instruments, RTD Probes, Elements and Assemblies, Temperature & Process Meters, Timers and Counters, Temperature and Process Controllers and Power Switching Devices, Thermistor Elements, Probes and Assemblies, Thermocouples Thermowells and Head and Well Assemblies, Transmitters, Wire

### • Flow and Level

Air Velocity Indicators, Doppler Flowmeters, Level Measurement, Magnetic Flowmeters, Mass Flowmeters, Pitot Tubes, Pumps, Rotameters, Turbine and Paddle Wheel Flowmeters, Ultrasonic Flowmeters, Valves, Variable Area Flowmeters, Vortex Shedding Flowmeters

### • pH and Conductivity

Conductivity Instrumentation, Dissolved Oxygen Instrumentation, Environmental Instrumentation, pH Electrodes and Instruments, Water and Soil Analysis Instrumentation

### • Data Acquisition

Auto-Dialers and Alarm Monitoring Systems, Communication Products and Converters, Data Acquisition and Analysis Software, Data Loggers Plug-in Cards, Signal Conditioners, USB, RS232, RS485 and Parallel Port Data Acquisition Systems, Wireless Transmitters and Receivers

### • Pressure, Strain and Force

Displacement Transducers, Dynamic Measurement Force Sensors, Instrumentation for Pressure and Strain Measurements, Load Cells, Pressure Gauges, Pressure Reference Section, Pressure Switches, Pressure Transducers, Proximity Transducers, Regulators, Strain Gages, Torque Transducers, Valves

### • Heaters

Band Heaters, Cartridge Heaters, Circulation Heaters, Comfort Heaters, Controllers, Meters and Switching Devices, Flexible Heaters, General Test and Measurement Instruments, Heater Hook-up Wire, Heating Cable Systems, Immersion Heaters, Process Air and Duct, Heaters, Radiant Heaters, Strip Heaters, Tubular Heaters