CALIBRATION

An annual calibration is recommended in order to maintain results consistent with product specifications. Perform a field calibration only when inaccurate values are suspected. Please visit www.ietlabs.com for details.

Field Calibration Overview

There are 30 resistance values that have to be entered during calibration.

To abort calibration at any time, press **MENU** prior to entering the final residual resistance value. None of the previously entered resistance values will be saved.

Required Tools

Calibrated, high-precision digital multimeter (DMM) having a resistance accuracy greater than 4 times that of the ohmSOURCE. The DMM must have 4-wire ohms-measurement capability and a minimum 6.5 digit resolution.

Calibration Instructions

1. Connect the ohmSOURCE to the DMM using 4-wire, measurement setup (true-ohm setting, if available).
2. Press **MENU**, then press **3** to calibrate.
3. Using the number keys, enter the resistance value shown on the DMM. Press **enter** to continue.
4. Follow the DMM screen prompts for each calibration point.

When the message "Calibration Saved" is displayed, calibration is complete.

5. Verify performance of the ohmSOURCE against published specifications by measuring resistance value across the range with DMM.

OPTIONAL ACCESSORIES

OS-91.001   Software Development Kit
For simulating RTD's, this software kit lets users download up to three different data tables into the ohmSOURCE. These data tables, containing up to 256 equivalences, also make it possible for the unit to simulate transducers such as thermistors and conductivity sensors. For convenient PC connection, the software kit includes a USB cable.

SERVICE AND SUPPORT

IET LABS, Inc. offers full repair and calibration services at its corporate headquarters. Do not attempt to repair or modify the ohmSOURCE Electronically Controlled Resistance Box, as this will void the product warranty. Any service required other than battery replacement or calibration must be referred to IET LABS, Inc. Please contact IET LABS, Inc. or visit www.ietlabs.com for further information.

Telephone: (516) 334-5959
FAX: (516) 334-5988
534 Main Street
Westbury, NY 11590

WARRANTY

⚡ WARNING ⚡

OBSERVE ALL SAFETY RULES WHEN WORKING WITH HIGH VOLTAGES OR LINE VOLTAGES.

Dangerous voltages may be present inside this instrument. Do not open the case
Refer servicing to qualified personnel

HIGH VOLTAGES MAY BE PRESENT AT THE TERMINALS OF THIS INSTRUMENT

WHENEVER HAZARDOUS VOLTAGES (> 45 V) ARE USED, TAKE ALL MEASURES TO AVOID ACCIDENTAL CONTACT WITH ANY LIVE COMPONENTS.

USE MAXIMUM INSULATION AND MINIMIZE THE USE OF BARE CONDUCTORS WHEN USING THIS INSTRUMENT.

Use extreme caution when working with bare conductors or bus bars.

WHEN WORKING WITH HIGH VOLTAGES, POST WARNING SIGNS AND KEEP UNREQUIRED PERSONNEL SAFELY AWAY.

⚠ CAUTION ⚠

DO NOT APPLY ANY VOLTAGES OR CURRENTS TO THE TERMINALS OF THIS INSTRUMENT IN EXCESS OF THE MAXIMUM LIMITS INDICATED ON THE FRONT PANEL OR THE OPERATING GUIDE LABEL

♦ PRECISION INSTRUMENTS FOR TEST AND MEASUREMENT ♦

ohmSOURCE®
Electronically Controlled Resistance Box

User and Service Manual

Copyright © 2012 IET Labs, Inc.
Visit www.ietlabs.com for manual revision updates

OS Series im/May 2012

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INTRODUCTION

This handheld ohmSOURCE is an effective option for field applications in all industries including automotive, medical, test and measurement, and telecommunications. This microprocessor-controlled, programmable resistance decade box provides highly accurate and stable resistance values. It features a user-friendly interface, resistances of up to 24 MΩ, power of up to 1 W, and two banana-to-alligator cables for convenient connection. While remaining cost-effective, the ohmSOURCE still offers many advanced features to ensure that it is practical for both laboratory and field applications.

Quick-value keys:
Recall up to four frequently used resistance values with one touch.

Memory keys:
Store resistance values in up to 10 additional memory locations (0-9).

Current limit (user-defined):
Limits the amount of current passing through the ohmSOURCE to prevent possible damage.

Increment value setting:
Change resistance by user-defined increments or select standard resistance values.

Open key:
Completely isolates the output terminals from each other.

Automatic residual resistance compensation:
The residual resistance of the ohmSOURCE is automatically included in the output resistance value.
No zero-resistance subtraction required.

Electrical isolation:
The ohmSOURCE circuit is completely isolated

Auto-off power:
To conserve power, the ohmSOURCE automatically shuts off after 4 minutes of inactivity.

Field calibration:
Easily calibrate the ohmSOURCE with a high-precision ohmmeter. Annual factory calibration is recommended.

Flash software updates:
To allow reprogramming of ohmSOURCE firmware, the microprocessor has flash program memory.

Specifications:

	Model OS-260	Model OS-270
Range	0* to 24,000,000.0 Ω	0* to 1,500,000.00 Ω
Resolution	0.1 Ω	0.01 Ω
Accuracy	≤1,000.0 Ω: ±0.5 Ω >1,000.0 Ω: ±0.1%	≤1,000.0 Ω: ±0.1 Ω >1,000.0 Ω: ±0.01%
Power Rating	1.0 W	1.0 W
Power Supply	4 AAA alkaline batteries	4 AAA alkaline batteries

Minimum settable resistance, determined at calibration, is approximately 1 Ω

FEATURES & KEY FUNCTIONS

Key	Description	Function

Basic operation

Key	Description	Function
enter ON/OFF	Turns the OS unit on and off, and selects resistance value	To turn on, press **ON/OFF**. To turn off, hold **ON/OFF** for 3 seconds.
0-9, 000	Used to enter numerical values.	To select desired numerical value, dial up as needed. **(-)** is used with OS-91.001 option only.
←	Deletes the last character from the display.	To delete the last character, press ←.

Options

MENU	Displays the following submenu: 1. STANDARD VALUES 　1: 1% STD VALUES 　2: 5% STD VALUES 　3: 10% STD VALUES 　4: RATIOMETRIC 2. CONFIGURE 　1: LCD CONTRAST 　2: AUTO-OFF ENABLE 　3: AUTO-OFF DISABLE 3. CALIBRATE 4. VERSION	Press **MENU** to select one of the following: 1. STANDARD VALUES - selects increments for the rotary switch. 2. CONFIGURE - allows user to adjust display contrast and enable/disable Auto-off feature 3. CALIBRATE - see calibration section 4. VERSION - Displays current firmware version and release date.
INCR	Selects the increments for the rotary switch. Default value: Ratiometric (0.8% of displayed value)	To adjust increments: 1. Press **INCR**. 2. Enter desired increment value on the keypad. 3. Press **ENTER** to save.

Storing and recalling resistance values

| STO	Stores a resistance value in memory locations A-D and 0-9.	To store a value, press **STO** and then press the desired location button A-D or 0-9.
A, B, C, D	Recalls a stored resistance value. Default values: **A**: 10 kΩ　**B**: 100 kΩ **C**: 1 MΩ　**D**: 1.5 MΩ	To change stored values: 1. Enter a resistance value 2. Press **STO** and then **A**, **B**, **C**, or **D**.
RCL	Recalls a stored resistance value from memory location 0-9.	To recall a stored value, press **RCL**, then press the desired location button (0-9)

Limiting Current

VOLT	Sets voltage to limit the current in order to protect the OS unit from possible damage. Default value: 0.5 V	To adjust voltage: 1. Press **VOLT**. 2. Enter desired voltage on the keypad. 3. Press **ENTER** to save.

Electrical Isolation

OPEN	Isolates the connection terminals by establishing an open circuit.	To open the circuit, press **OPEN**. To close, press **OPEN** again.

Option: Simulating RTD's and transducers

TABLE	Loads up to 3 stored data tables for simulating RTD's or transducers.	To select the desired table, press **TABLE** to cycle through the three options.
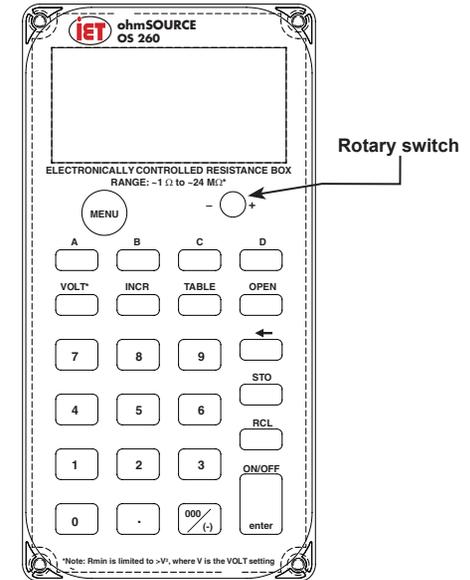
Rotary switch

OPERATING INSTRUCTIONS

1. Connect the supplied test leads.
2. Turn on the device on by pressing **ON/OFF**.
3. Select a desired resistance value in one of the following ways:
   a) Rotary switch
   b) Enter a value using the number keys, then press **enter**.
   c) Press a Quick Value key (**A** – **D**) to display a user-defined value or a factory default value.
   Default values are: **A**: 10 kΩ │ **B**: 100 kΩ │ **C**: 1 MΩ │ **D**: 1.5 MΩ
   d) Press **RCL** then a number key (**0 – 9**) to display a user-defined value or a factory default value.
   Default values are: **0** - 100 Ω │ **1** - 1 kΩ │ **2** - 2 kΩ │ **3** - 3 kΩ │ **4** - 4 kΩ │ etc.
4. ⚠ To prevent possible damage to the OS unit, set the maximum applied voltage by pressing **VOLT**, entering the voltage on the keypad, then pressing **enter**. (Default: 0.5 V)

The firmware sets the minimum selectable resistance value so that the power does not exceed 1 W. To ensure that the whole range of resistances is selectable, VOLT setting must be ≤1 V.
R_{min} is limited to $>V^2$, where V is the VOLT setting.

5. Connect to the circuit or device under test.

To isolate the ohmSOURCE from the application, press **OPEN** to open the circuit. To close the circuit, press **OPEN** again.

To turn off the unit, press and hold **enter** for 3 seconds.
The Auto-Off feature turns the unit off after 4 minutes of inactivity, unless disabled by the user.