

MeasureOHM® User Guide

Roth Technologies, LLC

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I. Introduction

Welcome to the MeasureOHM® User Guide. This manual will provide you basic instructions on how to implement and use the MeasureOHM® software and hardware. Use of this software is subject to the End Users License Agreement (EULA) which is located on our website at www.measureohm.com.

II. Reference Documents

- **MeasureOHM® End User License Agreement (EULA)**, Roth Technologies, LLC
- **Installing MySQL ODBC Driver**, Roth Technologies, LLC
- **Adding and Registering MSSTDFMT.DLL (Windows 7/8 OS)**, Roth Technologies, LLC
- **mSPECIFY™ User Guide**, Roth Technologies, LLC
- **mDATA™ User Guide**, Roth Technologies, LLC

III. Necessary Components

The following components are necessary in order to run the MeasureOHM® system:

1. The software, identified as MeasureOHM.EXE, which is included on the Installation CD that was provided with your order. This software may also be downloaded from our website at www.measureohm.com.
2. The MySQL ODBC driver must be loaded on your test computer.
 - If you are running Windows XP, you must load the MySQL 3.5.1 Driver, 32 bit driver
 - If you are running Windows 7 or Windows 8, you must load the MySQL 5.1 Driver, 32 bit driver. Other operation systems are NOT supported
 - Note that in both cases, you MUST load the 32 bit driver MySQL driver even if your operating system is 64 bit.
3. Your computer that is used to run the software MUST be connected to the Internet. There is an interchange of material data between the computer and the MySQL Server. If the interchange of data is slow and/or interrupted, the program may not run correctly or timeout.
4. The MeasureOHM® Hardware System which consists of the following components:
 - Test Computer: The test computer performs the following functions (a) runs the MeasureOHM® software, (b) communicates to the MeasureOHM® Hardware Box via a USB 2.0 interface, (c) communicates to the Fluke Digital Multimeter via RS-232 serial interface, and (d) communicates with the MySQL database which contains the configuration data and stores the test results
 - MeasureOHM® Multiplexing Hardware Box
 - Fluke 8808A Digital Multimeter
 - Optional 19 inch rack mount for mounting the MeasureOHM® Multiplexing Hardware Box and Fluke 8808A Digital Multimeter

IV. Running the Program

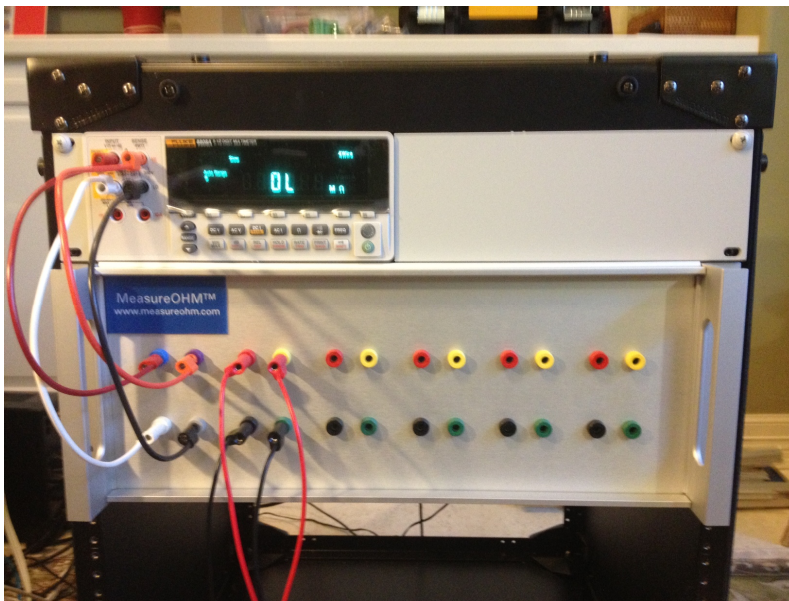
In order to run the program, it must be copied from the media that it was provided to you on (i.e. on a CD-ROM and/or USB Flash Drive) to the Desktop of the computer you intend to run it on.

Warning: The program WILL NOT execute if you try to run it directly from the CD-ROM drive.

Once the program is on the computer Desktop, you can double click the MeasureOHM® Program Icon to execute it. A splash screen similar to the one shown appears when the program is run. The current software will only run on Windows XP, Windows 7, and Windows 8. Previous versions of the Windows Operating System are NOT supported.

V. Hardware

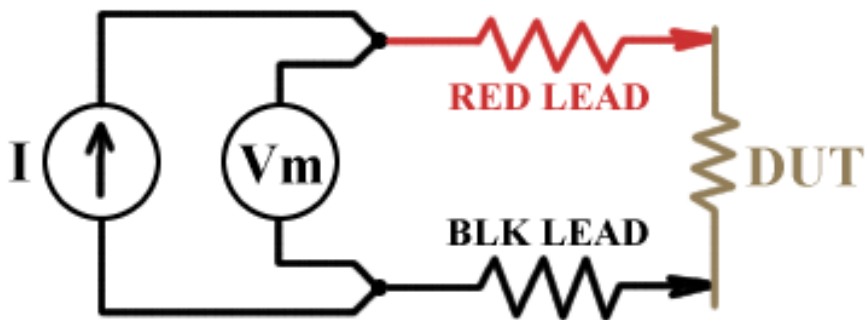
The following illustration shows the MeasureOHM® Multiplexing Hardware Box AND the Fluke 8808A Digital Multimeter in a standard 19 inch rack. The first left most port is the connection port between the MeasureOHM® Box and the Fluke 8808A. The remaining ports are the input ports where the User may make their 4-Wire Electrical Measurement connections. Port 1 is the left most port and Port N is the right most port.



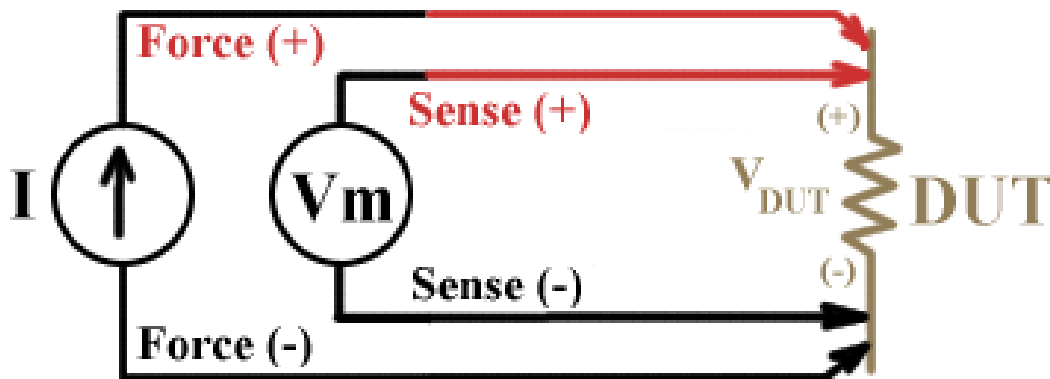
VI. MeasureOHM® Four Wire Resistance Measurement

The combination of the MeasureOHM® Multiplexing Hardware Box AND the Fluke 8808A Digital Multimeter allow multiple resistance measurements to be made nearly simultaneously and also very precisely using the Four Wire Resistance Measurement method. In order to understand the Four Wire Resistance Measurement method better, we first will look at the Two Wire Resistance Measurement Method.

When you make a Two Wire Resistance Measurement the typical ohm meter uses only two leads to connect to the device under test (DUT) as shown. This setup has the advantage of using just two wires to connect to the DUT. The illustration shows that the voltmeter is really measuring the voltage across the DUT and the test leads. As a result, Two Wire measurements actually measure the DUT resistance plus the test lead resistance.

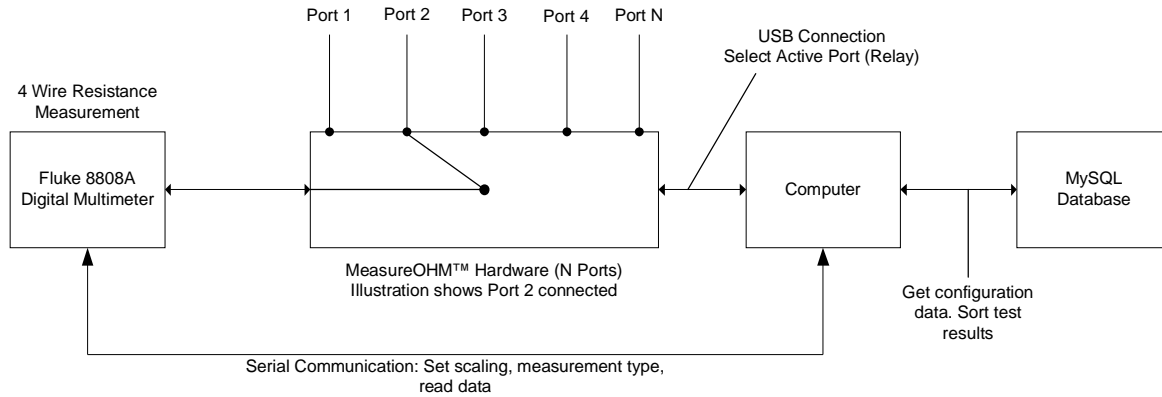


The MeasureOHM® system has four connections to the DUT. Two of the connections come from the current source (sometimes called the "force" leads), and the other two connections come from the voltmeter (usually called the "sense" leads). With four connections you choose where to connect the voltmeter so you are in control over exactly what resistance you want to measure. If you connect the meter directly to your DUT you will measure just the resistance of the DUT as illustrated.



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The MeasureOHM® Hardware system allows for multiple resistive connections to be connected. Standard configuration for the system consist of 4, 8, and 16 connections depending on the hardware purchased.



The MeasureOHM® system has been programmed to work with the Fluke 8808A Digital Multimeter. The advantage of the Fluke 8808A Digital Multimeter is the following:

- It offers testing ranges from 200 ohms to 100 Mohms with 1 mOHM sensitivity
- 5 - 1/2 digit resolution
- In order to calibrate the entire system, the only part that needs to be calibrated is the Fluke 8808A Digital Multimeter.

The following table summarizes the resistance measurement specification for the Fluke 8808A Digital Multimeter for 4 wire resistance measurement method.

Input Characteristics					
Range	Full-Scale (5-1/2 Digits)	Resolution			Current Source
		Slow	Medium	Fast	
200 Ω	199.999 Ω	0.001 Ω	0.01 Ω	0.01 Ω	0.8 mA
2 k Ω	1.99999 k Ω	0.01 Ω	0.1 Ω	0.1 Ω	0.8 mA
20 k Ω	19.9999 k Ω	0.1 Ω	1 Ω	1 Ω	0.08 mA
200 k Ω	199.999 k Ω	1 Ω	10 Ω	10 Ω	0.008 mA
2 M Ω	1.99999 M Ω	10 Ω	100 Ω	100 Ω	0.9 μ A
20 M Ω	19.9999 M Ω	100 Ω	1 k Ω	1 k Ω	0.16 μ A
100 M Ω	100.000 M Ω	1 k Ω	10 k Ω	10 k Ω	0.16 μ A 10 M Ω

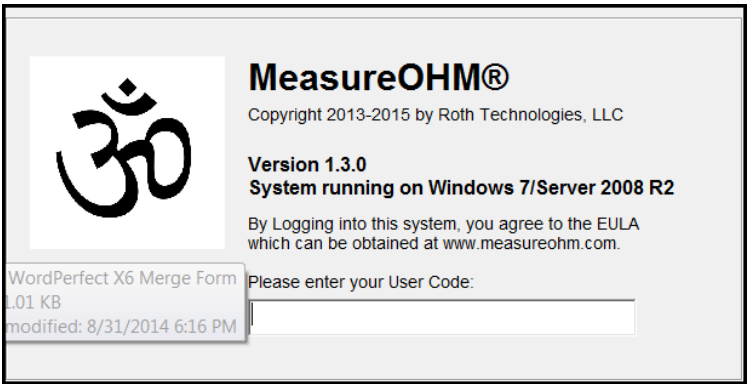
Accuracy			
Range	Accuracy ^[1]		Temperature Coefficient/°C Outside 18 – 28 °C
	90 days	1 year	
	23 °C \pm 5 °C	23 °C \pm 5 °C	
200 Ω	0.02 + 0.004	0.03 + 0.004	0.003 + 0.0006
2 k Ω	0.015 + 0.002	0.02 + 0.003	0.003 + 0.0005
20 k Ω	0.015 + 0.002	0.02 + 0.003	0.003 + 0.0005
200 k Ω	0.015 + 0.002	0.02 + 0.003	0.003 + 0.0005
2 M Ω	0.03 + 0.003	0.04 + 0.004	0.004 + 0.0005
20 M Ω	0.2 + 0.003	0.25 + 0.003	0.01 + 0.0005
100 M Ω	1.5 + 0.004	1.75 + 0.004	0.2 + 0.0005
Notes:			
[1] Accuracy given as \pm (% of reading + % of range)			

If there is a different standard of multimeter utilized in your industry, contact us and we will write the interface code to make the software/hardware work with your configuration.

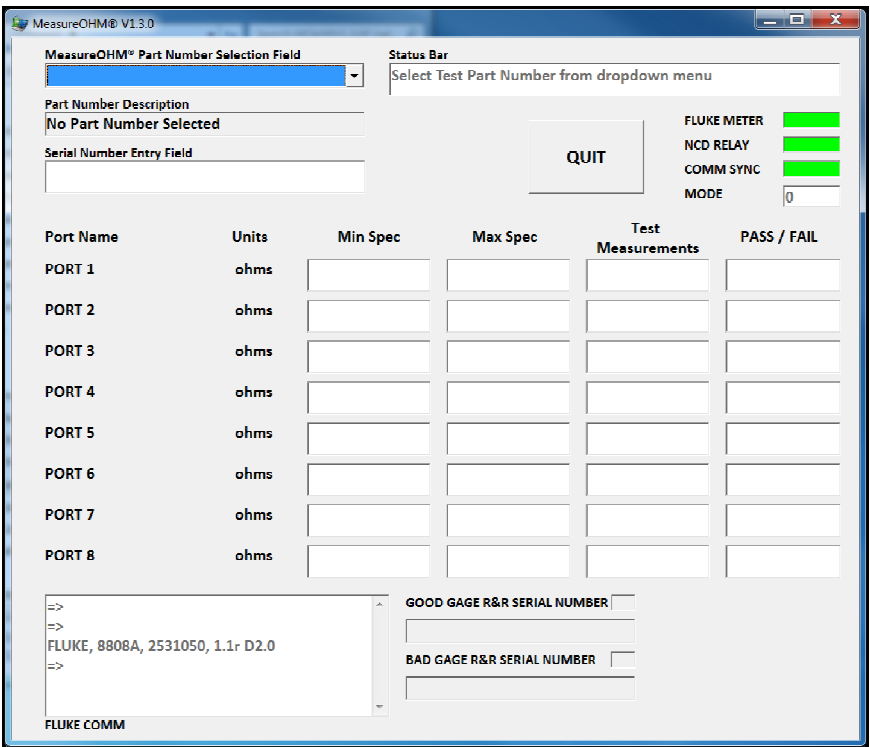
VII. Using the MeasureOHM® System

In a production environment, the following are the steps for taking data using the MeasureOHM® system once it has been configured as per Sections V and VI.

Step 1: Log into the system. Your company has been provided a twelve character length password for logging into the MeasureOHM® system. You may submit a request to sales@measureohm.com to change your password character string. This character string identifies your company within the MeasureOHM® system. If you happen to lose control of your passcode, contract sales@cathcad.com and we will change your login passcode.



After logging into the system, the Main Menu will appear on the screen as shown. The software at this point is waiting for a test part number to be selected from the drop down menu. Configuration of a test part number is done via the utility program, mSPECIFY™.



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Step 2: Make measurement connections to your part. If you are testing many parts, it would be wise to invest in a mechanical fixture which would allow the part to be tested to be connected to the MeasureOHM® System quickly.

Step 3: Enter (or scan with a bar code reading if your part has a bar code on it) the part serial number into the Serial Number Entry Field and press enter. If the part bar code matches the configured serial number format, the following message will appear.

Step 4: If the Serial Number entered meets the configured serial number format, the TEST button will appear on the screen. Select the TEST button to proceed with part testing.

MeasureOHM® V1.3.0

MeasureOHM® Part Number Selection Field

10001010A

Part Number Description

Valve, 24 Volt

Serial Number Entry Field

10001010A 00000011

Status Bar

Load Part & Select TEST to make test measurement(s)

TEST

QUIT

FLUKE METER

NCD RELAY

COMM SYNC

MODE

3

Port Name	Units	Min Spec	Max Spec	Test Measurements	PASS / FAIL
PORT 1A	ohms	9.7000	10.300		
PORT 2A	ohms	1,450.0	1,550.0		
PORT 3A	ohms	980,000	1,020,000		
PORT 4A	ohms	9.8000	10.200		
PORT 5A	ohms	9,800.0	10,200		
PORT 6A	ohms	98,000	102,000		
PORT 7A	ohms	98.000	102.00		
PORT 8A	ohms	9,800,000	10,200,000		

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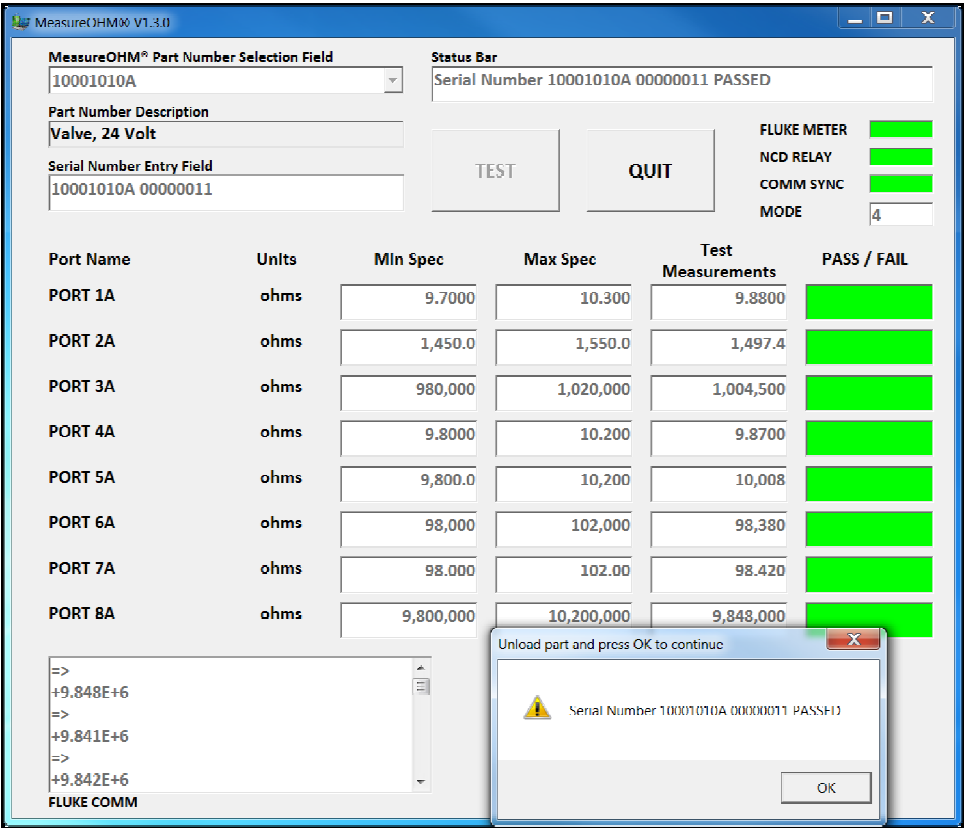
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Step 5: After the MeasureOHM® software takes all the readings, the software will a determination of the part status. If all the readings are within the min/max specification -- the part has passed the test. If any of the readings are outside the their individual min/max specifications -- the part will fail the test. The following screen shot shows an example where the part has passed the test.



The results from your test configuration are stored on the MySQL database.

Step 6: After reviewing your test results, click the OK button. The test results and serial number field will clear themselves. This will allow you to disconnect the test part from the system and continue testing new parts.

VIII. Reporting Errors

Report system crashes via email to sales@measureohm.com. Please provide as much information as possible with regards to the setup of the program when the error occurred.