g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-MVT-Calibration**

Calibration Procedure for Louisville MVT Test System

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A	Initial release	J. Barton	5/14/2013

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J. Barton			Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
5/14/2013			5/14/2013

1. SCOPE

1.1 This is a calibration procedure for the Louisville MVT test system.

2. STANDARDS OF QUALITY

2.1 Calibration of the MVT tester will only be done with its Digital Multimeter calibrated by an approved outside calibration Vendor.
2.2 Tolerances on the Megger are shown in section 8 later in this document.
2.3 Calibration shall only be done under the following environmental conditions.
2.3.1 Temperature 70°F ±10°F (60°F to 80°F)
2.3.2 Humidity 20 - 75% Relative Humidity

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.
3.1.1 IES13503 RMS9 Trip Unit Combination Calibrator/Options Dispenser/Functional Tester, Section 6 on Calibration Procedure. This is also included with in this document.

4. EQUIPMENT REQUIRED

4.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
1	H190081	Megger SMRT1
1	H190082	Keithley Multimeter
1	H190015	MVT System
1	H190078	1 ohm 5 watt resistor (located in MVT Cabinet)

5. Calibration Requirements

5.1.1 The Keithley meter must be calibrated to Z540 specs and installed into the RMS9 MVT Test System before calibration can be performed.

5.1.2 All yearly measurements from the procedure are recorded in a spreadsheet. There is a blank copy on the server as follows: J:\Biz_Data\Test Development\MVT System, located in the sdata directory. There is a copy in section 8 of this document. These shall be kept in the MVT System calibration folder.

6. Calibration Procedure

6.0 CALIBRATION PROCEDURE

6.1 VERIFICATION /CALIBRATION PROCEDURE

The SMRT1 Amplifier should be verified at least annually for proper operation. Use the front panel connections of the amplifier to verify voltage, using a calibrated DMM and SMRT1 diagnostic program.

6.1.1 1Disconnect the machine Voltage and Current leads from the front of the Megger.

6.1.2 Connect the DMM to the VOLTAGE output connector.

6.1.3 If the IES application is running, stop and exit the application.

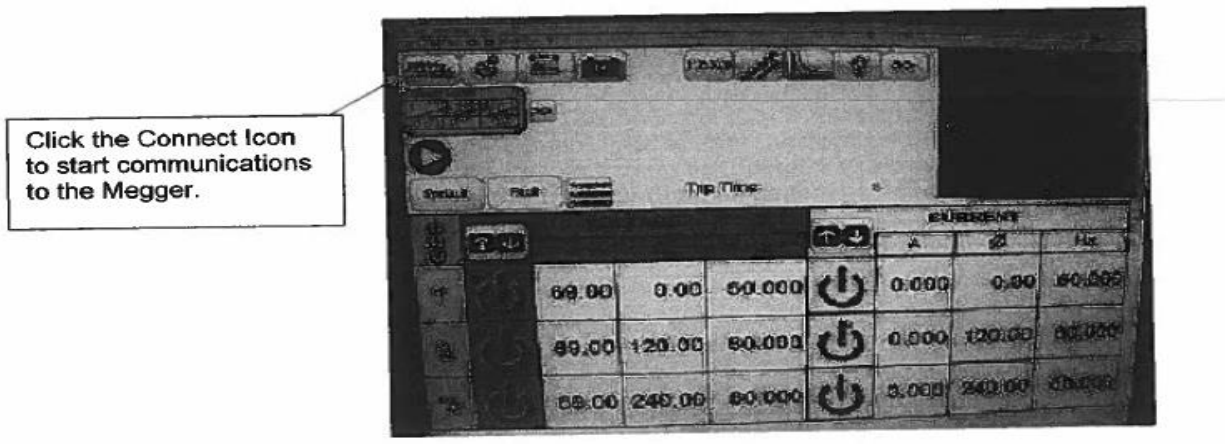
6.1.4 Start the SMRT application by clicking on the icon for "PowerDB 10 Advanced." The "Select an Instrument" menu should appear.

6.1.5 From the "Select an Instrument" list, Select "MPRT/SMRT" in the RELAY column. The Instrument Configuration Screen should appear.

6.1.6 Click "OK" on the Instrument Configuration screen. (No change is necessary.) The "Select a Form" screen should appear.

6.1.7 On the "Select a Form" menu, choose "SMRT and MPRT STVI."

6.1.8 The program will start with the default 3-Phase supply.



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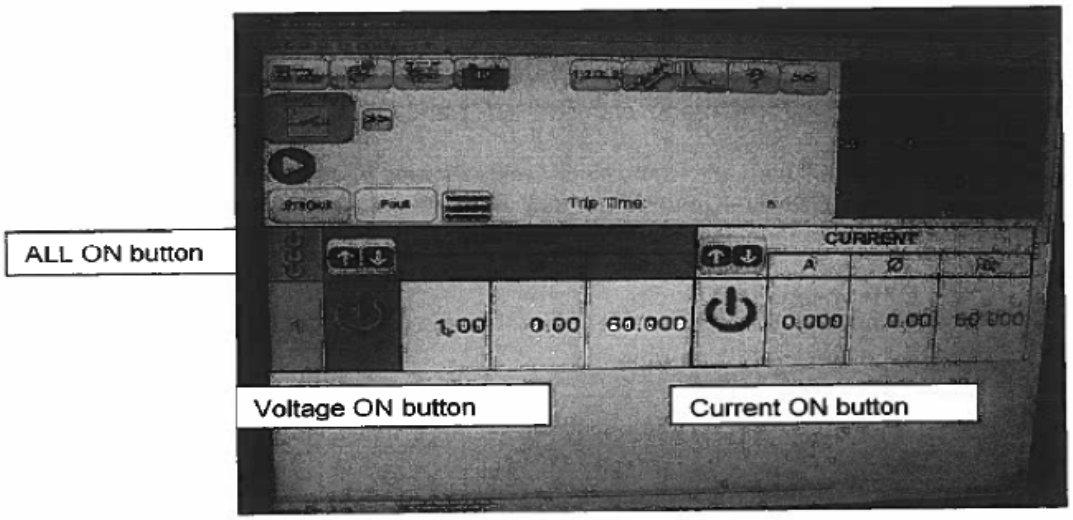
6.1.9 Click on the CONNECT icon (upper left); if the connection is successful, the display will automatically update to the proper single-phase supply.



6.1.10 Change the voltage to 1.0 volts.

6.1.11 Click the ALL ON icon.

6.1.12 Click the Voltage ON icon.

6.1.13 Measure the voltage at the DMM.

6.1.14 Repeat for 0.100V, 0.500V, and 2.00V. This covers the entire operating range of the IES tests.

6.1.15 If any measurement is not within 1% of the requested value, please contact IES.

6.2 Use the front panel connections and an appropriate load to verify current, using a calibrated DMM and the SMRT1 diagnostic program.

6.2.1 Disconnect the machine Voltage and Current leads from the front of the Megger.

6.2.2 Connect an ammeter to the Current output connector; an appropriate load MUST be inline with the ammeter. A 1-Ohm, 5W resistor is suitable.

6.2.3 If the IES application is running, stop and exit the application.

6.2.4 Start the SMRT application by clicking on the icon for "PowerDB 10 Advanced." The "Select an Instrument" menu should appear.

6.2.5 From the "Select an Instrument" list, Select "MPRT/SMRT" in the RELAY column. The Instrument Configuration Screen should appear.

6.2.6 Click "OK" on the Instrument Configuration screen. (No change is necessary.) The "Select a Form" screen should appear.

6.2.7 On the "Select a Form" menu, choose "SMRT and MPRT STVI."

6.2.8 The program will start with the default 3-Phase supply (see image, above). Click on the CONNECT icon (upper left). If the connection is successful, the display will automatically update to the proper single-phase supply.

6.2.9 Change the voltage to 0.0 volts.

6.2.10 Change the current to 0.5 amps.

6.2.11 Click the ALL ON icon.

6.2.12 Click the Current ON icon.

6.2.13 Measure the current at the ammeter.

6.2.14 Repeat for 0.200A, 1.000A, and 2.00A. This covers the entire operating range of the IES tests.

6.2.15 If any measurement is not within 1% of the requested value, please contact IES.

The Keithley DMM should be removed and calibrated at least annually by an independent calibration lab.

The Keithley DMM, if calibrated properly, can be used manually to verify the Megger power supply.

7. Additional Notes

7.1 None at this time.

8. Attachments

8.1 See MVT Megger Calibration Form on next page.

MVT MEGGER CALIBRATION FORM

IES 13503 MVT Option Programmer

VOLTAGE CALIBRATION @60HZ

NOMIAL TEST VOLTAGE	HIGH TOLERANCE	LOW TOLERANCE	Tolerances	ACTUAL	PASS/FAIL
0.1	0.106	0.094	0.006 (+/-6mV)		
0.5	0.506	0.494	0.006 (+/-6mV)		
1	1.01	0.99	0.01 (+/-1%)		
1.767	1.7847	1.7493	0.01767 (+/-1%)		
2	2.02	1.98	0.02 (+/-1%)		
2.697	2.724	2.67	0.02697 (+/-1%)		

CURRENT CALIBRATION @ 60HZ W/ 1 OHM/5W RESISTOR

NOMIAL TEST CURRENT	HIGH TOLERANCE	LOW TOLERANCE	Tolerances	ACTUAL	PASS/FAIL
0.5	0.506	0.494	0.006 (+/-6mV)		
0.2	0.206	0.194	0.002 (+/-6mV)		
1	1.01	0.99	0.01 (+/-1%)		
2	2.02	1.98	0.02 (+/-1%)		

Calibrated By:			
GE Asset Number for Megger:		H190081	
GE Asset Number for Keithley:		H190082	
GE Asset Number for MVT Tester		H190015	
Date:			
Calibration Due Date:			
Resistor #:		H190078	
Resistance Measurement		Meter Shorted	.00086 Ohms
Resistance Measurement		Calibration Resistor	1.006 Ohms

For more information reference IES13503 RMS9 Trip Unit Combination Calibrator/Options Dispenser/Functional Tester