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

Calibration Procedure for Louisville ATE System

REV.	DESCRIPTION	SIGNATURE	REV. DATE
Α	Initial release	E. Rouse/P. Kelley	10/25/2001
В	Updated and transcribed to an electronic format.	E. Rouse	10/15/2010
С	Updated to more comprehensive procedure.	E. Rouse	12/03/2010
D	Updated with pictures and Calibration tag	J. Barton	3/2/2016

© COPYRIGHT GENERAL ELECTRIC COMPANY

Hard copies are uncontrolled and are for reference only.

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
E. Rouse/P. Kelley	E. Rouse		Charlie Wade
DATE	DATE	DATE	DATE
10/25/2001	12/3/2010		10/15/2010

	g	
LOU-ATE-Calibration	GE Energy	Page 2 of 14
REV. D	Parts & Repair Services	
	Louisville, KY	

1. SCOPE

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

2. STANDARDS OF QUALITY

- **2.1** Calibration of tester will only be done with a currently calibrated Fluke 45 Dual Display Digital Multimeter or equivalent equipment.
- 2.2 Tolerances on the five ATE Universal Interface cards are set at +-0.03V. These cards were built specific for this fixture.
- **2.3** Calibration shall only be done under the following environmental conditions.

2.3.1 Temperature $70^{\circ}\text{F} \pm 10^{\circ}\text{F}$ (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 The internal virtual meter of the ATE can only read to hundredths of a volt. Whereas the Fluke 45 will read to thousandths of a volt. All adjustments will be made to calibrated standard of the Fluke 45 meter or equivalent.

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		Fluke 45 Dual Display Digital Multimeter or equivalent
1	H033890	Rainbow Interface Box
1	H033779	ATE System

5. Calibration Requirements

5.1.1 Five Universal Interface boards in the system require calibration on a yearly basis, using the procedure listed in section 6. Each Universal Interface board is comprised of 26 interface channels that require calibration, for a total of 130 channels. All yearly measurements from the procedure are recorded in a spreadsheet on the server as follows: J:\Biz_Data\Test Development\Documents\ATE System #1\ATECal Data\ATE Calibration Data mm-dd-yy. Located in the sdata directory. Use the ATE Calibration Blank.xls as your Template. DO NOT WRITE OVER the Template, Save with the Cal Date as a suffix to the file name.

LOU-ATE-Calibration REV. D

GE Energy Parts & Repair Services Louisville, KY

Page 3 of 14

Calibration Procedure 6.

- 6.1.1 Power the ATE system down.
- 6.1.2 Remove all 5 Universal Interface Boards from the system and remove their heat sink plates and bars to allow access to all calibration potentiometers. (Testing has found that removing the Heat sinks may not be necessary if ALL Channels PASS calibration tolerances)



- 6.1.3
- 6.1.4 Install the Extender Card for the Universal Interface Boards into Slot #1.
- 6.1.5 Re-insert Universal Interface Board#1 into slot 1 (far left) and power the system back up.

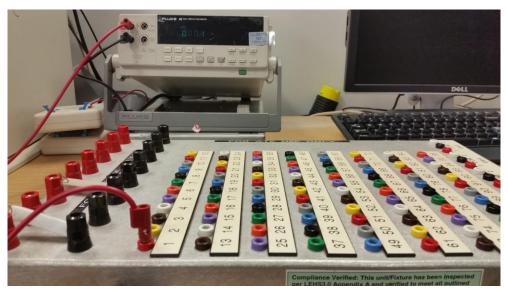


- 6.1.6
- 6.1.7 Connect the Rainbow interface box to the system.

LOU-ATE-Calibration REV. D

GE EnergyParts & Repair Services Louisville, KY

Page 4 of 14



6.1.8

6.1.9 Connect the negative lead of the Fluke 45 Meter (classified as a measurement standard) to system ground.



6.1.10

6.1.11 Connect the positive lead of the Fluke 45 Meter to the particular interface channel you are calibrating on the Rainbow box. Start with channel 1 and finish with channel 26.

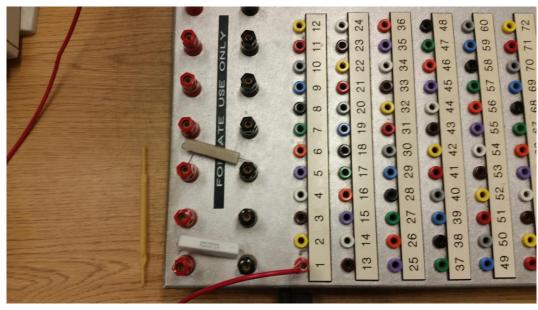
ibration

g

LOU-ATE-Calibration REV. D

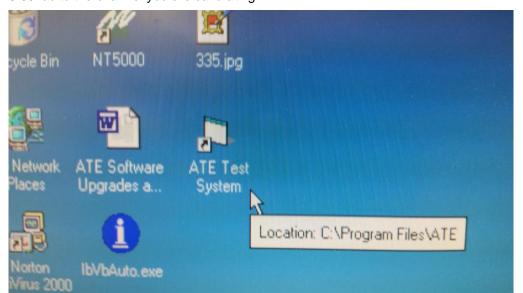
GE EnergyParts & Repair Services
Louisville, KY

Page 5 of 14



6.1.12

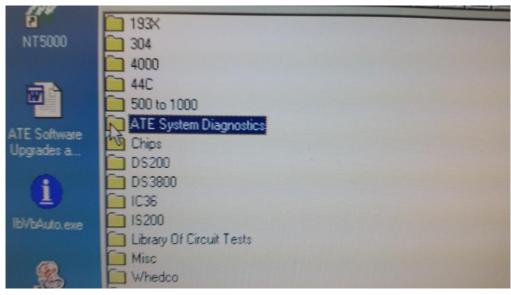
6.1.13 Run the "ATE Calibration Tool" program under "ATE System Diagnostics" to send 0.00vdc to the channel you are calibrating.

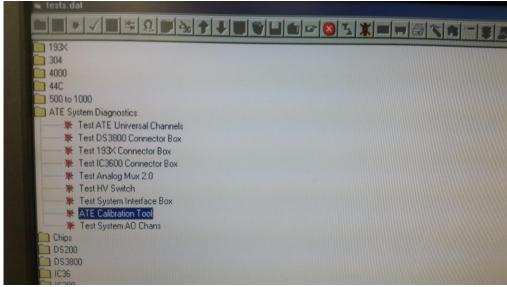


LOU-ATE-Calibration REV. D

GE Energy Parts & Repair Services Louisville, KY

Page 6 of 14





- 6.1.16
- **6.1.17** Within the "ATE Calibration Tool" will display a virtual voltmeter on the screen to measure the channel you are calibrating.
- **6.1.18** Record the Offset voltage displayed on the Fluke 45 Meter in the "Before Cal Offset Voltage-Fluke 45 Meter" column of the ATE Calibration Record form.

LOU-ATE-Calibration REV. D

GE Energy Parts & Repair Services Louisville, KY

Page 7 of 14

ATE Ca	libration	Record					Date					
Proced	ure	LOU-AT	E-Calibra	ation			Cal Due	Date	########			
Asset N	lumber		H03:	3779			Spe	cification	s 1 year			
					Before C	alibration				After Ca	libration	
Rainbow Box Number	ATE Channel Number	Operating Range	Nominal Level	Lower	D	irement ata ound	Upper Limit	Result Pass/Fail	Measurement Uncertainty	D	irement ata ound	Result Pass/Fai
					Fluke-45	Virtual Meter				Fluke-45 Meter	Virtual	
	0 VDC Off	fset Measu	ement Va	lues 🥖								
1	1	0.0V	0.0V	-0.03V)	0.03V		+0.03V			
2	2	0.0V	0.0V	-0.03V			0.03V		+0.03∀			
3	3	0.0V	0.0V	-0.03V			0.03V		+0.03V			
4	4	0.0V	0.0V	-0.03V			0.03V		+0.03V			
5	5	0.0V	0.0V	-0.03V			0.03V		+0.03V			
6	6	0.0V	0.0V	-0.03V			0.03V		+0.03∀			
7	7	0.0V	0.0V	-0.03V			0.03V		+0.03V			
8	8	0.0V	0.0V	-0.03V			0.03V		+0.03V			
9	9	0.0V	0.0V	-0.03V			0.03V		+0.03V			
10	10	0.0V	0.0V	-0.03V			0.03V		+0.03V			
11	11	0.0V	0.0V	-0.03V			0.03V		+0.03V			
12	12	0.0V	0.0V	-0.03V			0.03V		+0.03V			
13	13	0.0V	0.0V	-0.03V			0.03V		+0.03V			
14	14	0.0V	0.0V	-0.03V			0.03V		+0.03V			
15	15	0.0V	0.0V	-0.03V			0.03V		+0.03V			
16	16	0.0V	0.0V	-0.03V			0.03V		+0.03V			
17	17	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
18	18	0.0V	0.0V	-0.03V			0.03V		+0.03V			
19	19	0.0V	0.0V	-0.03V			0.03V		+0.03V			
20	20	0.0V	0.0V	-0.03V			0.03V		+0.03V			
21	21	0.0V	0.0V	-0.03V			0.03V		+0.03V			
22	22	0.0V	0.0V	-0.03V			0.03V		+0.03∀			
23	23	0.0V	0.0V	-0.03V			0.03V		+0.03V			
24	24	0.0V	0.0V	-0.03V			0.03V		+0.03V			
25	25	0.0V	0.0V	-0.03V			0.03V		+0.03V			
26	26	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	Asset Nur	nber used	to calibrat	e these ca	ırds			Board Seri	al Number	R23625	Board#	1
	Calibrate Calibrate							Temp Humidity				

6.1.20 Record the Offset voltage displayed on the Virtual Meter in the "Before Cal Offset Voltage-Virtual Meter" column of the ATE Calibration Record form.

lumber	umber		E-Calibra H03	ation 3779			Cal Due	Date	**********			
tainbow Box lumber	ATE Channel		H03:	3779								
Box lumber	Channel						Spe	cification	s 1 year			
Box lumber	Channel				Before C	alibration	1			After Ca	alibration	
		Operating Range	Nominal Level	Lower	D	urement ata ound	Upper Limit		Measurement Uncertainty	Measurement Data As Found		Result Pass/Fa
					Fluke-45 Meter	Virtual				Fluke-45 Meter	Virtual	
	0 VDC Off	set Measu	rement Va	lues						mee	meee	
	1	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	2	0.0V	0.0V	-0.03V	1		0.03V		+0.03V			
	3	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	4	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	5	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	6	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	7	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	8	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	9	0.0V	0.0V	-0.03V			0.03V		+0.03V			
0	10	0.0V	0.0V	-0.03V			0.03V		+0.03V			
1	11	0.0V	0.0V	-0.03V			0.03V		+0.03V			
2	12	0.0V	0.0V	-0.03V			0.03V		+0.03V			
3	13	0.0V	0.0V	-0.03V			0.03V		+0.03V			
4	14	0.0V	0.0V	-0.03V			0.03V		+0.03V			
5	15	0.0V	0.0V	-0.03V			0.03V		+0.03V			
6	16	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
7	17	0.0V	0.0V	-0.03V			0.03V		+0.03V			
8	18	0.0V	0.0V	-0.03V			0.03V		+0.03V			
9	19	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
0 :	20	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
1	21	0.0V	0.0V	-0.03V			0.03V		+0.03V			
2	22	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	23	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
	24	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
5	25	0.0V	0.0∀	-0.03V			0.03∨		+0.03V			
6	26	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
	Asset Nun	nber used	to calibrat	e these ca	ards			Board Seri	al Number	R23625	Board#	1
	Calibrate Calibrate							Temp Humidity				

LOU-ATE-Calibration
REV. D

GE Energy
Parts & Repair Services
Louisville, KY

Page 8 of 14

6.1.22 Record a P or F in the "Before Cal Pass/Fail" column of the ATE Calibration Record form to indicate whether the Offset and Gain voltages were within tolerance.

ATE Ca	libration	Record					Date					
Proced	ure	LOU-AT	E-Calibra	ation			Cal Due	Date	********			
Asset N	lumber		H033	3779			Spe	cification	s 1 year			
					Before C	alibration	1			After Ca	libration	1
Rainbow Box Number	ATE Channel Number	Operating Range	Nominal Level	Lower Limit	D:	rement sta ound	Upper Limit	Result Pass/Fail	Measurement Uncertainty	Measurement Data As Found		Result Pass/Fai
					Fluke-45 Meter	Virtual Meter				Fluke-45 Meter	Virtual Meter	
	0 VDC Off	set Measur	ement Va	lues								1
1	1	0.0V	0.0V	-0.03V			0.03V		+0.03V			
2	2	0.0V	0.0V	-0.03V			0.03V		+0.03V			
3	3	0.0V	0.0V	-0.03V			0.03V		+0.03V			
4	4	0.0V	0.0V	-0.03V			0.03V		+0.03V			
5	5	0.0V	0.0∨	-0.03V			0.03V		+0.03V			
6	6	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
7	7	0.0V	0.0V	-0.03V			0.03V		+0.03V			
В	8	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
9	9	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
10	10	0.0V	0.0V	-0.03V			0.03V		+0.03V			
11	11	0.0V	0.0V	-0.03V			0.03V		+0.03V			
12	12	0.0V	0.0V	-0.03V			0.03V		+0.03V			
13	13	0.0V	0.0V	-0.03V			0.03V		+0.03V			
14	14	0.0V	0.0V	-0.03V			0.03∨		+0.03V			
15	15	0.0V	0.0V	-0.03V			0.03V		+0.03V			
16	16	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
17	17	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
18	18	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
19	19	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
20	20	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
21	21	0.0V	0.0∀	-0.03V			0.03∀		+0.03V			
22	22	0.0V	0.0∀	-0.03V			0.03∀		+0.03V			
23	23	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
24	24	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
25	25	0.0V	0.0∀	-0.03V			0.03∀		+0.03V			
26	26	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
	Asset Nur	sset Number used to calibrate these cards						Board Ser	ial Number	R23625	Board#	1
		Calibrated on Calibrated by						Temp Humidity				

- **6.1.24** Hitting ENTER will initiate the ATE system to send out +7.50vdc to the universal channel you are calibrating.
- **6.1.25** Record the Gain voltage displayed on the Fluke 45 Meter in the "Before Cal Gain Voltage-Fluke 45 Meter" column of the ATE Calibration Record form.

LOU-ATE-Calibration REV. D g

GE EnergyParts & Repair Services
Louisville, KY

Page 9 of 14

7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47	ards		7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53	Board Seri Temp Humidity	0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V	R23625	Board #	1
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47	ards		7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53	Board Seri	0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V	R23625	Board#	1
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7,47 7,47 7,47 7,47 7,47 7,47 7,47 7,47			7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47 7.47			7.53 7.53 7.53 7.53		0.03V 0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V	7.47 7.47 7.47 7.47			7.53 7.53 7.53		0.03V 0.03V 0.03V			
7.5V 7.5V 7.5V	7.5V 7.5V 7.5V	7.47 7.47 7.47			7.53 7.53		0.03V 0.03V			
7.5V 7.5V	7.5V 7.5V	7.47 7.47			7.53		0.03V			
7.5V	7.5∀	7.47								
	_			_	7.52		0.021/			
7.50							0.034			
		7.47		+	7.53		0.03V			_
7.5V	7.5V	7.47			7.53		0.03V			
				+						_
				_		_				
				_						
				_		_				
				+						-
				/						_
			I	+)						
	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V 7.5V	7.5V 7.5V 7.47	7.5V 7.5V 7.47	7.5V 7.5V 7.47	7.5V 7.5V 7.47 7.53 7.5V 7.5V 7.47 7.53	7.5V 7.5V 7.47 7.53 7.53 7.5V 7.5V 7.47 7.53 7.53 7.5V 7.5V 7.47 7.53 7.50 7.5V 7.5V 7.47 7.53 7.5V 7.5V 7.5V 7.47 7.53	7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.5V 7.47 7.53 0.03V	7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.47 7.53 0.03V 7.5V	7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.5V 7.47 7.53 0.03V 7.5V 7.5V 7.5V 7.47 7.53 0.03V

6.1.26

6.1.27 Record the Gain voltage displayed on the Virtual Meter in the "Before Cal Gain Voltage-Virtual Meter" column of the ATE Calibration Record form.

	Calibra	ted by	0					Humidity	0			
	Calibra		1/0/1900					Temp	0			
		umber used		te these ca	ırds			Board Seria	al Number	R23625	Board #	1
26	26	7.5V	7.5∨	7.47			7.53		0.03∀			
25	25	7.5V	7.5∨	7.47			7.53		0.03V			
24	24	7.5V	7.5∨	7.47			7.53		0.03V			
23	23	7.5V	7.5∨	7.47			7.53		0.03∀			
22	22	7.5V	7.5V	7.47			7.53		0.03V			
21	21	7.5V	7.5∨	7.47			7.53		0.03V			Г
20	20	7.5V	7.5V	7.47			7.53		0.03∀			
19	19	7.5V	7.5V	7.47			7.53		0.03V			
18	18	7.5∨	7.5∨	7.47			7.53		0.03∨			
17	17	7.5V	7.5V	7.47			7.53		0.03V			Т
16	16	7.5V	7.5V	7.47			7.53		0.03V			
15	15	7.5V	7.5V	7.47			7.53		0.03V			
14	14	7.5V	7.5V	7.47			7.53	 	0.03V			-
13	13	7.5V	7.5V	7.47			7.53		0.03V			-
12	12	7.5V	7.5V	7.47			7.53		0.03V			-
11	11	7.5V	7.5∨	7.47		_	7.53	_	0.03V			\vdash
10	10	7.5V	7.5V	7.47		_	7.53	_	0.03V			_
9	9	7.5V	7.5V	7,47		_	7.53		0.03V			1
8	8	7.5V	7.5∨	7.47			7.53	_	0.03V			\vdash
7	7	7.5V	7.5V	7.47			7.53	_	0.03V			-
6	6	7.5V	7.5∨	7.47			7.53	+ -	0.03V			-
5	5	7.5V	7.5V	7.47		_	7.53	+	0.03V			\vdash
4	4	7.5V	7.5V	7.47		_	7.53	_	0.03V			\vdash
3	3	7.5V	7.5V	7.47		\sim	7.53	_	0.03V			+
2	2	7.5V	7.5V	7.47		lacksquare	7.53	+	0.03V		_	₩
1	1	Gain Meas	7.5	7.47		/	7.53		0.03V		_	1

6.1.28

6.1.29 Record a P or F in the "Before Cal Pass/Fail" column of the ATE Calibration Record form to indicate whether the Offset and Gain voltages were within tolerance.

LOU-ATE-Calibration REV. D

GE EnergyParts & Repair Services Louisville, KY

Page 10 of 14

	7.5 VD	Gain Meas	urement V	alues					T		
1	1	7.5∨	7.5∨	7.47		7.53		0.03∨			П
2	2	7.5∨	7.5∨	7.47		7.53		0.03∨			
3	3	7.5V	7.5∨	7.47		7.53		0.03V			
1	4	7.5∨	7.5∨	7.47		7.53		0.03V			
5	5	7.5∨	7.5∨	7.47		7.53		0.03∨			
5	6	7.5V	7.5V	7.47		7.53		0.03V			
7	7	7.5V	7.5∨	7.47		7.53		0.03V			
3	8	7.5V	7.5∨	7.47		7.53		0.03V			
)	9	7.5V	7.5V	7.47		7.53		0.03V			
10	10	7.5V	7.5∨	7.47		7.53		0.03V			
11	11	7.5V	7.5∨	7.47		7.53		0.03∨			
12	12	7.5V	7.5V	7.47		7.53		0.03V			
13	13	7.5V	7.5∨	7.47		7.53		0.03V			
14	14	7.5V	7.5∨	7.47		7.53		0.03∨			
15	15	7.5V	7.5∨	7.47		7.53		0.03V			
16	16	7.5V	7.5∨	7.47		7.53		0.03V			
17	17	7.5∨	7.5∨	7.47		7.53		0.03∨			
18	18	7.5∨	7.5∨	7.47		7.53		0.03∨			
19	19	7.5V	7.5∀	7.47		7.53		0.03∨			
20	20	7.5V	7.5∨	7.47		7.53		0.03∨			
21	21	7.5∨	7.5∨	7.47		7.53		0.03∨			
22	22	7.5V	7.5∨	7.47		7.53		0.03V			
23	23	7.5∨	7.5∀	7.47		7.53		0.03∀			
24	24	7.5∨	7.5∨	7.47		7.53		0.03∨			
25	25	7.5V	7.5∨	7.47		7.53		0.03V			
26	26	7.5∨	7.5∀	7.47		7.53		0.03V			
		umber used	l to calibrat	e these ca	ırds		Board Seri	al Number	R23625	Board #	1
	Calibra		1/0/1900				Temp	0			
	Calibra	ted by	0				Humidity	0			

- 6.1.30
- **6.1.31** Hitting ENTER will command the ATE system to send out +0.00vdc to the NEXT universal channel you are calibrating.
- **6.1.32** Adjust PotB* of the channel you are calibrating for 0.000vdc (+/-.001v) as seen on Fluke 45 Meter.
- **6.1.33** Record the Offset voltage displayed on the Fluke 45 Meter in the "After Cal Offset Voltage-Fluke 45 Meter" column of the ATE Calibration Record form.

_		Record					Date					
Proced	ure	LOU-AT	E-Calibra	ation			Cal Du	e Date	********			
Asset N	lumber		H033	3779			Spe	ecification	s 1 year			
					Before C	alibration	1			After Ca	libration	1
Rainbow					Measu	rement				Meas	irement	
Box	Channel	Operating	Nominal	Lower	D:	ata	Upper	Result	Measurement	D	ata	Result
Number	Number	Range	Level	vel Limit As Found Limit Pass/Fail Uncer	Limit	Uncertainty	As F	ound	Pass/Fa			
					Fluke-45	Virtual				Fluke-45	Virtual	
					Meter	Meter				Mater	Meter	
	0 VDC Off	íset Measui	rement Va	lues							\	
1	1	0.0V	0.0V	-0.03V			0.03V		+0.03V)	
2	2	0.0V	0.0V	-0.03V			0.03∨		+0.03V)		
3	3	0.0V	0.0V	-0.03V			0.03∨		+0.03V			
ţ	4	0.0V	0.0V	-0.03V			0.03V		+0.03V			
5	5	0.0V	0.0V	-0.03V			0.03V		+0.03V			
6	6	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
7	7	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
3	8	0.0V	0.0V	-0.03V			0.03V		+0.03V			
)	9	0.0V	0.0V	-0.03V			0.03V		+0.03V			
10	10	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
11	11	0.0V	0.0∀	-0.03V			0.03V		+0.03V			
12	12	0.0V	0.0V	-0.03V			0.03V		+0.03V			
13	13	0.0V	0.0V	-0.03V			0.03V		+0.03V			
14	14	0.0V	0.0V	-0.03V			0.03V		+0.03V			
15	15	0.0V	0.0V	-0.03V			0.03V		+0.03V			
16	16	0.0V	0.0V	-0.03V			0.03V		+0.03V			
17	17	0.0V	0.0V	-0.03V			0.03V		+0.03V			
18	18	0.0V	0.0V	-0.03V			0.03V		+0.03V			
19	19	0.0V	0.0V	-0.03V			0.03V		+0.03V			
20	20	0.0V	0.0V	-0.03V			0.03V		+0.03V			
21	21	0.0V	0.0V	-0.03V			0.03V	1	+0.03V			
22	22	0.0V	0.0V	-0.03V			0.03V		+0.03V			
23	23	0.0V	0.0V	-0.03V			0.03V		+0.03V			
24	24	0.0V	0.0V	-0.03V			0.03V		+0.03V			
25	25	0.00	0.07	-0.03V			0.03V		+0.03V			
26	26	0.0V	0.07	-0.03V			0.03V		+0.03V			
					rds		2.007	Board Ser	al Number	R23625	Board #	1
	Calibrate	set Number used to calibrate these card						Temp		TESSES	Dould II	
	Calibrate							Humidity				

GE Energy
Parts & Repair Services
Louisville, KY

LOU-ATE-Calibration REV. D

6.1.35 Record the Offset voltage displayed on the Virtual Meter in the "After Cal Offset Voltage-Virtual Meter" column of the ATE Calibration Record form.

Procedure LOU-ATE-Calibration							Date					
Proced	ure	LOU-AT	E-Calibra	ation			Cal Due	Date	########			
Asset Number			H03:	3779			Specifications		s 1 year			
					Before Calibration					After Calibration		
Rainbow	ATE				Measu	rement				Measurement		
Box	Channel	Operating	Nominal	Lower	D:	ata	Upper	Result	Measurement	Data		Result
Number	Number	Range	Level	Limit	As F	ound	Limit	Pass/Fail	Uncertainty	As Found		Pass/Fai
					Fluke-45	Virtual				Fluke-45	Virtual	
					Meter	Meter				Meter	Meter	
	0 VDC Off	fset Measu	rement Va	lues								
1	1	0.0V	0.0V	-0.03V			0.03V		+0.03V)
2	2	0.0V	0.0V	-0.03V			0.03∀		+0.03V		$\Big)$	
3	3	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
4	4	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
5	5	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
6	6	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
7	7	0.0V	0.0V	-0.03V			0.03V		+0.03V			
В	8	0.0V	0.0V	-0.03V			0.03V		+0.03V			
9	9	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
10	10	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
11	11	0.0V	0.0V	-0.03V			0.03V		+0.03V			
12	12	0.0V	0.0V	-0.03V			0.03V		+0.03V			
13	13	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
14	14	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
15	15	0.0V	0.0V	-0.03V			0.03V		+0.03V			
16	16	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
17	17	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
18	18	0.0V	0.0V	-0.03V			0.03∀		+0.03V			
19	19	0.0V	0.0V	-0.03V			0.03V		+0.03V			
20	20	0.0V	0.0V	-0.03V			0.03V		+0.03V			
21	21	0.0V	0.0∀	-0.03V			0.03∀		+0.03V			
22	22	0.0V	0.0V	-0.03V			0.03V		+0.03V			
23	23	0.0V	0.0V	-0.03V			0.03V		+0.03V			
24	24	0.0V	0.0V	-0.03V			0.03V		+0.03V			
25	25	0.0V	0.0V	-0.03V			0.03V		+0.03V			
26	26	0.0V	0.0V	-0.03V			0.03V		+0.03V			
	Asset Number used to calibrate these cards							Board Seri	al Number	R23625	Board#	1
	Calibrated on							Temp				
	Calibrate							Humidity				

- **6.1.37** Hitting ENTER will command the ATE system to send out +7.500vdc to the universal channel you are calibrating.
- **6.1.38** Adjust PotA* of the channel you are calibrating for a Gain voltage of 7.500vdc (+/-.001v) as seen on Fluke 45 Meter.
- **6.1.39** Adjust PotC* of the channel you are calibrating for a Gain Voltage of 7.50vdc (+/-.01v) as seen on Virtual Meter.
- **6.1.40** Record the Gain voltage displayed on the Fluke 45 Meter in the "After Cal Gain Voltage-Fluke 45 Meter" column of the ATE Calibration Record form.

LOU-ATE-Calibration REV. D

GE Energy Parts & Repair Services

Louisville, KY

g

Page 12 of 14

	Calibra Calibra		1/0/1900			Temp Humidity	0			
	Asset N	umber used	l to calibrat	e these cards		Board Serial Number		R23625	Board #	1
26	26	7.5V	7.5V	7.47	7.53		0.03V			
5	25	7.5V	7.5V	7.47	7.53		0.03V			
24	24	7.5∨	7.5V	7.47	7.53	+ -	0.03V			
23	23	7.5V	7.5V	7.47	7.53	_	0.03V			
22	22	7.5V	7.57	7.47	7.53	+ -	0.03V			\vdash
21	21	7.5V	7.5V	7.47	7.53	_	0.03V			\vdash
20	20	7.5V	7.5V	7.47	7.53	_	0.03V 0.03V			
19	19	7.5V	7.5V	7.47	7.53 7.53	+	0.03V 0.03V			-
17 18	17 18	7.5V	7.5V	7.47	7.53	+	0.03V			-
16	16	7.5V	7.5V	7.47	7.53		0.03V			-
15	15	7.5V	7.5∨	7.47	7.53		0.03V			-
14	14	7.5∨	7.5∨	7.47	7.53		0.03V			_
13	13	7.5∨	7.5∨	7.47	7.53		0.03V			_
12	12	7.5V	7.5∨	7.47	7.53		0.03V			_
11	11	7.5∨	7.5∨	7.47	7.53		0.03V			_
10	10	7.5∨	7.5∨	7.47	7.53		0.03V			
)	9	7.5V	7.5V	7.47	7.53		0.03V			
8	8	7.5∨	7.5∨	7.47	7.53		0.03V			
7	7	7.5V	7.5∨	7.47	7.53		0.03V			
6	6	7.5V	7.5V	7.47	7.53		0.03V			
5	5	7.5V	7.5∨	7.47	7.53		0.03V			
4	4	7.5V	7.5V	7.47	7.53		0.03V			
3	3	7.5V	7.5V	7.47	7.53		0.03V			
2	2	7.5V	7.5V	7.47	7.53		0.03V		/	
1	1	7.5V	7.5V	7.47	7.53		0.03V		1	$\overline{}$

6.1.41

6.1.42 Record the Gain voltage displayed on the Virtual Meter in the "After Cal Gain Voltage-Virtual Meter" column of the ATE Calibration Record form.

6.1.43

	7.5 VDC	Gain Meas	surement Va	lues							
1	1	7.5V	7.5∨	7.47		7.53		0.03V			D
2	2	7.5V	7.5∨	7.47		7.53		0.03V	•		7
3	3	7.5V	7.5∨	7.47		7.53		0.03V			
4	4	7.5V	7.5∨	7.47		7.53		0.03V			
5	5	7.5∨	7.5∨	7.47		7.53		0.03V			
6	6	7.5V	7.5∨	7.47		7.53		0.03V			
7	7	7.5V	7.5∨	7.47		7.53		0.03V			
3	8	7.5V	7.5∀	7.47		7.53		0.03∨			
9	9	7.5V	7.5∨	7.47		7.53		0.03V			
10	10	7.5V	7.5∨	7.47		7.53		0.03V			
11	11	7.5V	7.5∨	7.47		7.53		0.03∨			
12	12	7.5V	7.5∨	7.47		7.53		0.03V			
13	13	7.5V	7.5∨	7.47		7.53		0.03V			
14	14	7.5V	7.5∨	7.47		7.53		0.03∨			
15	15	7.5V	7.5∨	7.47		7.53		0.03V			
16	16	7.5V	7.5∨	7.47		7.53		0.03V			
17	17	7.5V	7.5∨	7.47		7.53		0.03∨			
18	18	7.5V	7.5∨	7.47		7.53		0.03V			
19	19	7.5V	7.5∨	7.47		7.53		0.03V			
20	20	7.5V	7.5∨	7.47		7.53		0.03V			
21	21	7.5V	7.5∨	7.47		7.53		0.03V			
22	22	7.5V	7.5∨	7.47		7.53		0.03V			
23	23	7.5V	7.5∨	7.47		7.53		0.03V			
24	24	7.5V	7.5∨	7.47		7.53		0.03V			
25	25	7.5V	7.5∨	7.47		7.53		0.03V			
26	26	7.5V	7.5∨	7.47		7.53		0.03V			
	Asset N	umber used	l to calibrate	e these ca	rds	Board Serial Number			R23625	Board#	1
	Calibra	ted on	1/0/1900				Temp	0			
	Calibra	ted by	0				Humidity	0			

6.1.44

6.1.45 Record a P or F in the "After Cal Pass/Fail" column of the ATE Calibration Record form to indicate whether the Offset and Gain voltages were within tolerance.

LOU-ATE-Calibration REV. D

GE Energy Parts & Repair Services Louisville, KY

Page 13 of 14

11 12	11	7.5V	7.5V	7.47		7.53 7.53	0.03V 0.03V	-	_
9	9	7.5V 7.5V	7.5V 7.5V	7.47 7.47		7.53 7.53	0.03V 0.03V		
12 13	12	7.5V 7.5V	7.5V 7.5V	7.47		7.53 7.53	0.03V 0.03V		
4	14	7.5V	7.5V	7.47		7.53	0.03V		
15 16	15	7.5V 7.5V	7.5V	7.47		7.53 7.53	0.03V 0.03V	_	-
7	17	7.5V	7.5V	7.47		7.53	0.03V		_
18	18	7.5∨	7.5∨	7.47		7.53	0.03V		
19 20	19	7.5V	7.5V	7.47		7.53 7.53	0.03V 0.03V	_	-
21	21	7.5V	7.5∨	7.47		7.53	0.03V		
22	22	7.5V	7.5∨	7.47		7.53	0.03V		
23	23	7.5∨	7.5∨	7.47		7.53	0.03V		
24	24	7.5∨	7.5∨	7.47		7.53	0.03∨		
25	25	7.5∨	7.5∨	7.47		7.53	0.03V		
26	26	7.5∨	7.5∨	7.47		7.53	0.03V		

6.1.46

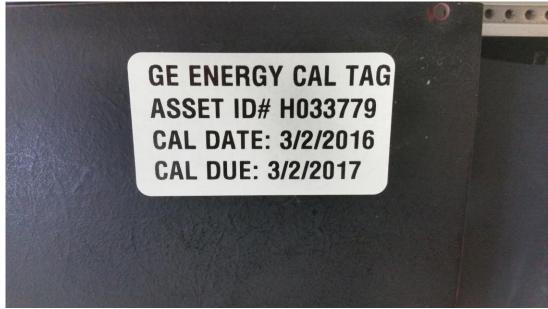
- **6.1.47** Repeat the recording and calibrating process for all 26 channels of the board.
- **6.1.48** Power the system down (Remove Power Supply's via the icon in the program) and remove Board#1 from slot 1. Bolt the heat sink components back on and move on to calibrating Board#2 in slot 1. It is much easier to calibrate all 5 boards using slot 1.
- **6.1.49** Insert Board#2 into Slot#1 and Initiate Calibration program.
- **6.1.50** Complete ALL Channels and ALL Boards by going to Step 6.1.18 and Repeating as necessary.
- **6.1.51** After calibrating all five boards, put the system back together.



6.1.53 Create Calibration Tag – See QA Work leader for Calibration Due Date

LOU-ATE-Calibration REV. D

GE Energy Parts & Repair Services Louisville, KY Page 14 of 14



6.1.54 C.4.55 Due the Test ATE Universal

6.1.55 Run the Test ATE Universal Channels Test to verify all boards are seated correctly and operating normally.

7. Additional Notes

7.1 None at this time.

8. Attachments

8.1 None at this time.