

# CALTRONIX

## Certificate of Calibration

CALTRONIX certifies that this instrument has been calibrated to published specifications using measurement standards traceable to the National Institute of Standards and Technology (NIST). CALTRONIX's calibration system meets or exceeds the requirements of MIL-STD-45662A, ANSI/NCSL Z540-1, ISO/IEC Guide 25 and ISO/IEC 17025.

CALTRONIX is accredited to ISO/IEC 17025 by ACLASS, Assured Calibration and Laboratory Accreditation Select Services, Certificate #'s AC-1182 & AC-1183.

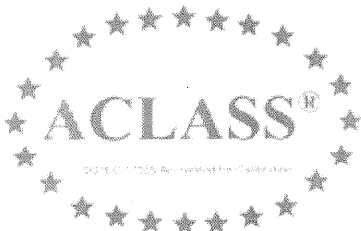
Customer :	UNIVERSITY OF BUFFALO WHITE ROAD BUFFALO, NY 14260	Test Uncertainty Ratio:> or =	4 : 1
Description :	DIGITAL MULTIMETER	Procedure :	METCAL
Manufacturer :	FLUKE	Interval :	12 Months
Model Number :	8050A	Date Received :	07/19/2007
Serial Number :	4237154	Date Calibrated:	07/27/2007
Company ID :		Date Due :	07/27/2008
R.O. Number :	7K960	Relative Humidity < or =	50 %
		Temperature	74 F +/- 3.0 F
			<b>INOPERABLE, REPAIRED AND CALIBRATED.</b>

Uncertainty budgets have been calculated at a 95% confidence level using a coverage factor of k=2.

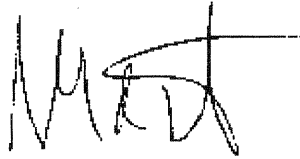
Calibration Facility : 100 Town Centre Drive <> Rochester, New York 14623

Asset	Manufacturer	Model No.	Description	Calcd	Due
3073	WAVETEK	9100/100/250	CALIBRATION SYSTEM	05/21/2007	05/21/2008

NIST	Cap	Sandia 49426	Volts	Fluke JJA	Dimen	821/270003
Numbers	Ind	811/264817	Res	811/269310	Mass	822/264749
	Freq	USNO (GPS)	Temp	255156		



TOM DIMATTEO  
Calibration Technician

  
Michael A. Dent 07/27/2007  
Director of Quality

CALTRONIX Inc. <> 100 Town Centre Drive <> Rochester, New York 14623 <> 585 359-3780 <> Fax 585 334-0064

This certificate may not be altered or reproduced, except in full, without written approval of CALTRONIX.

CALTRONIX INC.  
100 Town Centre Drive  
Rochester, New York 14623  
(585) 359-3780

07/27/2007

UNIVERSITY OF BUFFALO  
ATTN: CHRIS BUDDEN  
WHITE ROAD  
BUFFALO, NY 14260

Dear Customer:

In an effort to provide you, our valued customer, with as much information about your Test Equipment as possible this Repair Letter provides a summary of the repair actions taken on your equipment and a summary of the received conditions for this Test Instrument.

M & TE      Manufacturer :      FLUKE  
                 Model Number :      8050A  
                 Serial Number :      4237154  
                 Company ID :  
                 Description :      DIGITAL MULTIMETER  
                 R.O. Number :      7K960

The Repaired condition(s) were as Follows:

Unit would not power up due to both  
battery packs unable to hold a charge.  
Replaced both battery packs.

Our records indicate this unit was received for Repair  
1 time(s) out of the last 4 time(s) we recieved this unit.  
The following is a history of the last 10 received conditions.

0 ->	Repair	5 ->
1 ->	In Tolerance	6 ->
2 ->	Out of Tolerance	7 ->
3 ->	Out of Tolerance	8 ->
4 ->		9 ->

TOM DIMATTEO  
Calibration Technician

MICHAEL DENT  
DIRECTOR OF QUALITY

CALTRONIX INC.  
100 Town Centre Drive  
Rochester, New York 14623  
(585) 359-3780

07/27/2007

UNIVERSITY OF BUFFALO  
ATTN: CHRIS BUDDEN  
WHITE ROAD  
BUFFALO, NY 14260

Dear Customer:

In accordance with Caltronix, Inc.'s Quality System, you are hereby notified that the following listed M&TE was Out-Of-Tolerance when received for Calibration.

M & TE           Manufacturer :   FLUKE  
                  Model Number :   8050A  
                  Serial Number :   4237154  
                  Company ID    :  
                  Description  :   DIGITAL MULTIMETER  
                  R.O. Number  :   7K960

The Out-Of-Tolerance condition(s) were as Follows:

DC VOLTAGE,DC CURRENT,AND RESISTANCE  
FUNCTIONS WERE OUT OF TOLERANCE.  
ALIGNMENT PROCEDURE PERFORMED TO RESTORE  
UNIT TO WITHIN MFG SPECS.  
SEE BEFORE AND AFTER DATA.

Our records indicate this unit was received Out-Of-Tolerance  
3 time(s) out of the last 5 time(s) we recieved this unit.  
The following is a history of the last 10 received conditions.

0 ->	Out of Tolerance	5 ->
1 ->	Repair	6 ->
2 ->	In Tolerance	7 ->
3 ->	Out of Tolerance	8 ->
4 ->	Out of Tolerance	9 ->

TOM DIMATTEO  
Calibration Technician

MICHAEL DENT  
DIRECTOR OF QUALITY



C A L I B R A T I O N   D A T A   S H E E T

CALTRONIX, Inc.

100 Town Centre Drive

Rochester, NY 14623

(585) 359-3780   FAX (585) 334-0064

R.O. Number	7K960	Calibrated By	47	Date Calibrated	07/27/07
Manufacturer	FLUKE	Company	UNIVERSITY OF BUFFALO		
Model	8050A	Serial	4237154		
Description	DIGITAL MULTIMETER	ID No.			

AS FOUND

Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
1000.0V		1003.6	999.5	1000.5	FAIL
AC VOLTAGE					
200mV Range					
190.00mV @ 100Hz		190.64	188.95	191.05	PASS
190.00mV @ 10kHz		190.67	188.95	191.05	PASS
190.00mV @ 50kHz		188.92	180.20	199.80	PASS
2V Range					
0V		0	0	0	PASS
0.1000V @ 100Hz		0.1004	0.0985	0.1015	PASS
1.9000V @ 100Hz		1.9065	1.8895	1.9105	PASS
1.9000V @ 10kHz		1.9065	1.8895	1.9105	PASS
1.9000V @ 50kHz		1.8877	1.8020	1.9980	PASS
20V Range					
19.000V @ 100Hz		19.064	18.895	19.105	PASS
19.000V @ 10kHz		19.083	18.895	19.105	PASS
19.000V @ 50kHz		19.093	18.020	19.980	PASS
200V Range					
190.00V @ 100Hz		190.64	188.95	191.05	PASS
100.00V @ 10kHz		100.43	99.40	100.60	PASS
750V Range					
750.0V @ 100Hz		752.5	745.2	754.8	PASS
750.0V @ 1kHz		752.2	745.2	754.8	PASS
dB VOLTAGE TESTS					
UUT reading below -75dBm					
Result of Operator Evaluation					
-37.78dBm		-37.73	-38.28	-37.28	PASS
-37.78dBm		-37.73	-38.28	-37.28	PASS
2.22dBm		2.25	2.07	2.37	PASS
RESISTANCE					
20 MOhm Range					
10.00 MOhm		10.00	9.97	10.03	PASS
2000 kOhm Range					
1000.0 kOhm		1000.3	997.2	1002.8	PASS
200 kOhm Range					
100.00 kOhm		100.01	99.93	100.07	PASS
200nS Range					
100.0nS		100.0	99.3	100.7	PASS
20 kOhm Range					
10.000 kOhm		10.004	9.993	10.007	PASS
2 kOhm Range					
1.0000 kOhm		0.9997	0.9988	1.0012	PASS

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R.O. Number	7K960	Calibrated By	47	Date Calibrated	07/27/07
Manufacturer	FLUKE	Company	UNIVERSITY OF BUFFALO		
Model	8050A	Serial	4237154		
Description	DIGITAL MULTIMETER	ID No.			

AS FOUND

Parameter/Range	True Value	Test Result	Acceptance Lo Limit	Limits Hi Limit	
200 Ohm Range					
0.00 Ohm		0.14	0.00	0.04	FAIL
100.00 Ohm		100.14	99.88	100.14	PASS
2mS Range					
1.0000mS		1.0003	0.9985	1.0015	PASS
DC CURRENT					
200uA Range					
190.00uA		190.69	189.41	190.59	FAIL
2mA Range					
1.9000mA		1.9064	1.8941	1.9059	FAIL
20mA Range					
19.000mA		19.100	18.941	19.059	FAIL
200mA Range					
190.00mA		190.72	189.41	190.59	FAIL
2000mA Range					
1900.0mA		1906.6	1894.1	1905.9	FAIL
AC CURRENT					
20mA Range					
19.000mA @ 100Hz		19.092	18.800	19.200	PASS

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R.O. Number	7K960	Calibrated By	47	Date Calibrated	07/27/07
Manufacturer	FLUKE	Company	UNIVERSITY OF BUFFALO		
Model	8050A	Serial	4237154		
Description	DIGITAL MULTIMETER	ID No.			

AS LEFT

Test

Result

Acceptance Limits

Lo Limit

Hi Limit

True

Value

Parameter/Range

DISPLAY TEST

overrange indicator					
Result of Operator Evaluation					PASS
00.00 to 00.04					
Result of Operator Evaluation					PASS
.0000					
Result of Operator Evaluation					PASS
0.000					
Result of Operator Evaluation					PASS
00.00					
Result of Operator Evaluation					PASS
000.0					
Result of Operator Evaluation					PASS
0.000					
Result of Operator Evaluation					PASS
.....					
Result of Operator Evaluation					PASS
all segments of the digits illuminated					
Result of Operator Evaluation					PASS
display segments					
Result of Operator Evaluation					PASS
high voltage indicator (HV) on					
Result of Operator Evaluation					PASS
high voltage indicator (HV) off					
Result of Operator Evaluation					PASS
negative sign (-)					
Result of Operator Evaluation					PASS
(dB) and (rel) indicators on					
Result of Operator Evaluation					PASS

DC VOLTAGE

200mV Range					
190.00mV	190.00	189.92	190.08		PASS
-190.00mV	-189.98	-190.08	-189.92		PASS
2V Range					
1.9000V	1.9000	1.8992	1.9008		PASS
-1.9000V	-1.9000	-1.9008	-1.8992		PASS
20V Range					
19.000V	19.000	18.992	19.008		PASS
200V Range					
190.00V	190.00	189.92	190.08		PASS
1000V Range					

CALIBRATION DATA SHEET

CALTRONIX, Inc.

100 Town Centre Drive

Rochester, NY 14623

(585) 359-3780 FAX (585) 334-0064

R.O. Number 7K960      Calibrated By 47      Date Calibrated 07/27/07

Manufacturer FLUKE      Company UNIVERSITY OF BUFFALO

Model 8050A      Serial 4237154

Description DIGITAL MULTIMETER      ID No.

Parameter/Range	True Value	AS LEFT	Acceptance Limits		
		Test Result	Lo Limit	Hi Limit	
1000.0V		1000.0	999.5	1000.5	PASS
AC VOLTAGE					
200mV Range					
190.00mV @ 100Hz		189.95	188.95	191.05	PASS
190.00mV @ 10kHz		189.98	188.95	191.05	PASS
190.00mV @ 50kHz		188.27	180.20	199.80	PASS
2V Range					
0V		0	0	0	PASS
0.1000V @ 100Hz		0.0999	0.0985	0.1015	PASS
1.9000V @ 100Hz		1.8995	1.8895	1.9105	PASS
1.9000V @ 10kHz		1.8996	1.8895	1.9105	PASS
1.9000V @ 50kHz		1.8811	1.8020	1.9980	PASS
20V Range					
19.000V @ 100Hz		18.999	18.895	19.105	PASS
19.000V @ 10kHz		19.008	18.895	19.105	PASS
19.000V @ 50kHz		19.017	18.020	19.980	PASS
200V Range					
190.00V @ 100Hz		189.98	188.95	191.05	PASS
100.00V @ 10kHz		100.01	99.40	100.60	PASS
750V Range					
750.0V @ 100Hz		749.8	745.2	754.8	PASS
750.0V @ 1kHz		749.3	745.2	754.8	PASS
dB VOLTAGE TESTS					
UUT reading below -75dBm					
Result of Operator Evaluation					
-37.78dBm		-37.76	-38.28	-37.28	PASS
-37.78dBm		-37.75	-38.28	-37.28	PASS
2.22dBm		2.22	2.07	2.37	PASS
RESISTANCE					
20 MOhm Range					
10.00 MOhm		10.00	9.97	10.03	PASS
2000 kOhm Range					
1000.0 kOhm		1000.1	997.2	1002.8	PASS
200 kOhm Range					
100.00 kOhm		100.01	99.93	100.07	PASS
200nS Range					
100.0nS		100.0	99.3	100.7	PASS
20 kOhm Range					
10.000 kOhm		10.000	9.993	10.007	PASS
2 kOhm Range					



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Manufacturer	FLUKE	Company	UNIVERSITY OF BUFFALO		
Model	8050A	Serial	4237154		
Description	DIGITAL MULTIMETER	ID No.			

Parameter/Range	True Value	AS LEFT	Acceptance Limits		
		Test Result	Lo Limit	Hi Limit	
1.0000 kOhm		0.9996	0.9988	1.0012	PASS
200 Ohm Range					
0.00 Ohm		0.04	0.00	0.04	PASS
100.00 Ohm		100.04	99.88	100.14	PASS
2mS Range					
1.0000mS		1.0004	0.9985	1.0015	PASS
DC CURRENT					
200uA Range					
190.00uA		189.97	189.41	190.59	PASS
2mA Range					
1.9000mA		1.8993	1.8941	1.9059	PASS
20mA Range					
19.000mA		19.028	18.941	19.059	PASS
200mA Range					
190.00mA		190.01	189.41	190.59	PASS
2000mA Range					
1900.0mA		1899.4	1894.1	1905.9	PASS
AC CURRENT					
20mA Range					
19.000mA @ 100Hz		19.024	18.800	19.200	PASS