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

Description : **SCOPEMETER**
Manufacturer : **FLUKE**
Model Number : **123**
Serial Number : **DM8680584**
Company ID :
R.O. Number : **7K961**

Test Uncertainty Ratio:> or = **4 :1**
Procedure : **METCAL**
Interval : **12 Months**
Date Received : **07/19/2007**
Date Calibrated: **07/25/2007**
Date Due : **07/25/2008**
Relative Humidity **< or = 50 %**
Temperature **74 F +/- 3.0 F**

IN TOLERANCE

Uncertainity 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	Caled	Due
9042	FLUKE	5520A	CALIBRATOR	10/13/2006	10/13/2007

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

ACLASS

JAMES R. COYLE
Calibration Technician

Michael A. Dent 07/25/2007
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 7K961 Calibrated By 30 Date Calibrated 07/25/07

Manufacturer FLUKE Company UNIVERSITY OF BUFFALO
Model 123 Serial DM8680584
Description SCOPEMETER ID No.

AS FOUND/LEFT

Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
BACKLIGHT TEST					
Result of Operator Evaluation					PASS
BACKLIGHT POWER SAVE TEST					
Result of Operator Evaluation					PASS
DISPLAY TEST MAXIMUM DARKNESS					
Result of Operator Evaluation					PASS
DISPLAY TEST DEFAULT BRIGHTNESS					
Result of Operator Evaluation					PASS
DISPLAY TEST MAXIMUM BRIGHTNESS					
Result of Operator Evaluation					PASS
INPUT A AND B BASE LINE JUMP TES 5 ms/d -10 ms/d					
Result of Operator Evaluation					PASS
INPUT A AND B BASE LINE JUMP TES 1us/d - 100 ns/d					
Result of Operator Evaluation					PASS
INPUT A AND B BASE LINE JUMP TES 5 mV/d - 10 mV/d					
Result of Operator Evaluation					PASS
INPUT A 5 MHz TRIGGER SENSITIVIT TEST					
Result of Operator Evaluation					PASS
INPUT A 25 MHz TRIGGER SENSITIVIY TEST					
Result of Operator Evaluation					PASS
INPUT A 40 MHz TRIGGER SENSITIVIY TEST					
Result of Operator Evaluation					PASS
INPUT A FREQUENCY RESPONSE, UPPE TRANSISTION POINT					
425mV @ 20MHz	424.4	431	295	554	PASS
INPUT A FREQUENCY MEASUREMENT ACURACY TEST					
1.000MHz		1.000	0.993	1.007	PASS
10.00MHz		10.03	9.88	10.12	PASS
40.00MHz		39.95	38.98	41.02	PASS
INPUT B FREQUENCY MEASUREMENT ACURACY TEST					
1.000MHz		1.000	0.993	1.007	PASS
10.00MHz		9.99	9.88	10.12	PASS
40.00MHz		39.96	38.98	41.02	PASS
INPUT B FREQUENCY RESPONSE, UPPE TRANSISTION POINT					
425mV @ 20MHz	422.5	432	293	552	PASS
INPUT B 5 MHz TRIGGER SENSITIVIT TEST					
Result of Operator Evaluation					PASS
INPUT B 25 MHz TRIGGER SENSITIVIY TEST					
Result of Operator Evaluation					PASS
INPUT B 40 MHz TRIGGER SENSITIVIY TEST					
Result of Operator Evaluation					PASS
INPUT A TRIGGER LEVEL POSITIVE SOPE TEST					

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AS FOUND/LEFT

Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
2.0V		2.0	1.5	2.5	PASS
INPUT A TRIGGER LEVEL NEGATIVE SOPE TEST					
2.0V		2.1	1.5	2.5	PASS
INPUT B TRIGGER LEVEL POSITIVE SOPE TEST					
2.0V		1.8	1.5	2.5	PASS
INPUT B TRIGGER LEVEL NEGATIVE SOPE TEST					
2.0V		2.1	1.5	2.5	PASS
DC VOLTAGE					
5mV/div					
INPUT A					
15mV		15	14	16	PASS
INPUT B					
15mV		15	14	16	PASS
10mV/div					
INPUT A					
30mV		30	29	31	PASS
INPUT B					
30mV		30	29	31	PASS
20mV/div					
INPUT A					
60mV		60	59	61	PASS
INPUT B					
60mV		60	59	61	PASS
50mV/div					
INPUT A					
150mV		151	149	151	PASS
INPUT B					
150mV		150	149	151	PASS
100mV/div					
INPUT A					
300mV		300	298	302	PASS
INPUT B					
300mV		300	298	302	PASS
200mV/div					
INPUT A					
500mV		500	497	503	PASS
-500mV		-500	-503	-497	PASS
0mV		0	-1	1	PASS
INPUT B					
500mV		500	497	503	PASS
-500mV		-500	-503	-497	PASS

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Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
0mV		0	-1	1	PASS
500mV/div					
INPUT A					
1.5V		1.5	1.5	1.5	PASS
INPUT B					
1.5V		1.5	1.5	1.5	PASS
1V/div					
INPUT A					
3V		3	3	3	PASS
INPUT B					
3V		3	3	3	PASS
2V/div					
INPUT A					
5V		5	5	5	PASS
-5V		-5	-5	-5	PASS
0V		0	-0	0	PASS
INPUT B					
5V		5	5	5	PASS
-5V		-5	-5	-5	PASS
0V		0	-0	0	PASS
5V/div					
INPUT A					
15V		15	15	15	PASS
INPUT B					
15V		15	15	15	PASS
10V/div					
INPUT A					
30V		30	30	30	PASS
INPUT B					
30V		30	30	30	PASS
20V/div					
INPUT A					
50V		50	50	50	PASS
-50V		-50	-50	-50	PASS
0V		0	-0	0	PASS
INPUT B					
50V		50	50	50	PASS
-50V		-50	-50	-50	PASS
0V		0	-0	0	PASS
50V/div					
INPUT A					

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AS FOUND/LEFT

Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
150V		150	149	151	PASS
INPUT B					
150V		150	149	151	PASS
100V/div					
INPUT A					
300V		300	298	302	PASS
INPUT B					
300V		300	298	302	PASS
AC VOLTAGE					
200mV/div					
INPUT A					
500mV @ 60Hz		499	494	506	PASS
500mV @ 20kHz		501	486	514	PASS
INPUT B					
500mV @ 60Hz		500	494	506	PASS
500mV @ 20kHz		499	486	514	PASS
2V/div					
INPUT A					
5V @ 60Hz		5	5	5	PASS
5V @ 20kHz		5	5	5	PASS
INPUT B					
5V @ 60Hz		5	5	5	PASS
5V @ 20kHz		5	5	5	PASS
20V/div					
INPUT A					
50V @ 60Hz		50	49	51	PASS
50V @ 20kHz		50	49	51	PASS
INPUT B					
50V @ 60Hz		50	49	51	PASS
50V @ 20kHz		50	49	51	PASS
COUPLING					
INPUT A					
500mV @ 10Hz		402	374	500	PASS
500mV @ 33Hz		487	470	500	PASS
500mV @ 60Hz		496	487	500	PASS
INPUT B					
500mV @ 10Hz		402	374	500	PASS
500mV @ 33Hz		488	470	500	PASS
500mV @ 60Hz		496	487	500	PASS
VOLTS PEAK					
INPUT A					

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Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
5Vpp @ 1kHz		5	5	5	PASS
INPUT B					
5Vpp @ 1kHz		5	5	5	PASS
PHASE					
Input A&B use same signal:					
5520 TUR does not apply to this est.					
INPUT A					
0deg		0	-2	2	PASS
INPUT B					
0deg		0	-2	2	PASS
DC VOLTAGE: 500V RANGE					
INPUT A					
500V		500	497	503	PASS
-500V		-499	-503	-497	PASS
0V		0	-1	1	PASS
INPUT B					
500V		500	497	503	PASS
-500V		-500	-503	-497	PASS
0V		0	-1	1	PASS
AC VOLTAGE: 500V RANGE					
INPUT A					
500V @ 60Hz		499	494	506	PASS
500V @ 10kHz		500	486	514	PASS
INPUT B					
500V @ 60Hz		499	494	506	PASS
500V @ 10kHz		497	486	514	PASS
DC VOLTAGE: 1250V RANGE					
INPUT A					
600V		601	592	608	PASS
-600V		-601	-608	-592	PASS
0V		0	-5	5	PASS
INPUT B					
600V		599	592	608	PASS
-600V		-599	-608	-592	PASS
0V		0	-5	5	PASS
AC VOLTAGE: 1250V RANGE					
INPUT A					
600V @ 60Hz		600	584	616	PASS
600V @ 10kHz		603	570	630	PASS
INPUT A					
600V @ 60Hz		599	584	616	PASS

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Parameter/Range	True Value	Test Result	Acceptance Limits Lo Limit	Hi Limit	
600V @ 10kHz		595	570	630	PASS
RESISTANCE					
0 Ohm		0	-1	1	PASS
400 Ohm		400	397	403	PASS
4 kOhm		4	4	4	PASS
40 kOhm		40	40	40	PASS
400 kOhm		400	397	403	PASS
4 MOhm		4	4	4	PASS
30 MOhm		30	30	30	PASS
CONTINUITY					
Result of Operator Evaluation					PASS
Result of Operator Evaluation					PASS
DIODE TEST: CURRENT					
test current with 1kOhm, read UU voltage					
1000 Ohm	500.0	497	425	575	PASS
DIODE TEST: VOLTAGE					
1V		1	1	1	PASS
CAPACITANCE					
40nF		40	39	41	PASS
300nF		300	293	307	PASS
3uF		3	3	3	PASS
30uF		30	29	31	PASS
300uF		301	293	307	PASS
0.0nF		0.0	-0.1	0.1	PASS