



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

Upstate Metrology, Inc.

6388 Niver Rd.

Conesus NY 14435

has been assessed by ANAB
and meets the requirements of international standard

ISO/IEC 17025:2005

and national standard

ANSI/NCSL Z540-1-1994

while demonstrating technical competence in the field of

CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of calibrations to which this accreditation applies.

AC-1215

Certificate Number


ANAB Approval

Certificate Valid: 08/04/2016-04/09/2018
Version No. 005 Issued: 08/04/2016



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).



ANSI-ASQ National Accreditation Board

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005 AND ANSI/NCSL Z540.3-2006

Upstate Metrology, Inc.

6388 Niver Rd Conesus, NY 14435

Chris Maggiulli
cmaggiul@gmail.com

www.upstatemetrology.co
Phone: 585-292-6430

CALIBRATION

Valid to: April 9, 2018

Certificate Number: AC-1215

I. Electromagnetic - DC/Low Frequency

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
DC Voltage – Measure ⁹	Up to 100 mV	2.8 μV	HP 3458A Opt 002
	100 mV to 1 V	8.4 μV	
	(1 to 10) V	79 μV	HP 3458A Opt 002, Ross Hi-Z Probe
	(10 to 100) V	1.1 mV	
	100 V to 1.1 kV	11 mV	
	(1.1 to 10) kV	0.12 V	
	(10 to 120) kV	13 V	
DC Voltage – Source ⁹	Up to 220 mV	7.6 μV	Fluke 5700A Series II
	220 mV to 2.2 V	7.0 μV	
	(2.2 to 11) V	51 μV	
	(11 to 22) V	13 μV	
	(22 to 220) V	52 μV	
DC Current – Measure ⁹	220 V to 1.1 kV	7 mV	HP 3458A Opt 002, Current Shunts
	(1 to 100) μA	6.8 nA	
	100 μA to 1 mA	28 nA	
	(1 to 10) mA	.36 mA	
	(10 to 100) mA	13 μA	
DC Current – Source ⁹	100 mA to 1 A	0.25 mA	Fluke 5700A Series II
	Up to 220 μA	24 nA	
	220 μA to 2.2 mA	0.10 μA	
	(2.2 to 22) mA	1.3 μA	
	(22 to 220) mA	17 μA	
	220 mA to 2.2 A	0.31 mA	
	(1 to 10) A	8.5 μA/A	Fluke 5700A with Fluke 5220A Amplifier
	(10 to 20) A	13 μA/A	



AC Voltage – Measure ⁹	(1 to 10) mV		
	(1 to 40) Hz		7.4 μ V
	40 Hz to 1 kHz		4.4 μ V
	(1 to 20) kHz		2.8 μ V
	(20 to 50) kHz		13 μ V
	(50 to 100) kHz		59 μ V
	(100 to 300) kHz		0.5 mV
	300 kHz to 1 MHz		0.12 mV
	(10 to 100) mV		
	(1 to 40) Hz		14 μ V
	40 Hz to 1kHz		11 μ V
	(1 to 20) kHz		19 μ V
	(20 to 50) kHz		37 μ V
	(50 to 100) kHz		96 μ V
	(100 to 300) kHz		0.4 mV
	300 kHz to 1 MHz		1.3 mV
	(1 to 4) MHz		5.4 mV
	(4 to 8) MHz		5.6 mV
	100 mV to 1 V		
	(1 to 40) Hz		0.13 mV
	40 Hz to 1kHz		0.11 mV
	(1 to 20) kHz		0.19 mV
	(20 to 50) kHz		0.38 mV
	(50 to 100) kHz		0.95 mV
	(100 to 300) kHz		3.6 mV
	(300 to 500) kHz		12 mV
	500 kHz to 1 MHz		24 mV
(1 to 4) MHz		47 mV	
(4 to 8) MHz		47 mV	
(1 to 10) V			
(1 to 40) Hz		1.9 mV	
40 Hz to 1kHz		1.1 mV	
(1 to 20) kHz		1.9 mV	
(20 to 50) kHz		3.7 mV	
(50 to 100) kHz		9.5 mV	
(100 to 300) kHz		36 mV	
300 to 1 MHz		0.12 V	
(1 to 2) MHz		54 mV	
(2 to 4) MHz		0.15 V	
(4 to 8) MHz		0.15 V	
(10 to 100) V			
(1 to 40) Hz		28 mV	
40 Hz to 1 kHz		26 mV	
(1 to 20) kHz		26 mV	
(20 to 50) kHz		43 mV	
(50 to 100) kHz		0.14 V	
100 V to 750 V			
(1 to 40) Hz		0.37 V	
40 Hz to 1 kHz		0.35 V	
			HP 3458A Opt 002

AC Voltage – Source ⁹	(2.2 to 22) mV		
	(10 to 20) Hz	8 μV	
	(20 to 40) Hz	6.7 μV	
	40 Hz to 20 kHz	6.3 μV	
	(20 to 50) kHz	6.5 μV	
	(50 to 100) kHz	11 μV	
	(100 to 300) kHz	18 μV	
	(300 to 500) kHz	34 μV	
	500 kHz to 1 MHz	38 μV	
	(22 to 220) mV		
	(10 to 20) Hz	20 μV	
	(20 to 40) Hz	11 μV	
	40 Hz to 20 kHz	8.1 μV	
	(20 to 50) kHz	16 μV	
	(50 to 100) kHz	26 μV	
	(100 to 300) kHz	38 μV	
	(300 to 500) kHz	64 μV	
	500 kHz to 1 MHz	0.11 mV	
	220 mV to 2.2 V		
	(10 to 20) Hz	0.14 mV	
	(20 to 40) Hz	54 μV	
	40 Hz to 20 kHz	32 μV	
	(20 to 50) kHz	75 μV	
	(50 to 100) kHz	0.21 mV	
	(100 to 300) kHz	0.26 mV	
	(300 to 500) kHz	0.39 mV	
	500 kHz to 1 MHz	0.81 mV	
(2.2 to 22) V			
(10 to 20) Hz	1.2 mV		
(20 to 40) Hz	0.36 mV		
40 Hz to 20 kHz	0.17 mV		
(20 to 50) kHz	0.28 mV		
(50 to 100) kHz	0.57 mV		
(100 to 300) kHz	1.1 mV		
(300 to 500) kHz	2.6 mV		
500 kHz to 1 MHz	5.4 mV		
22 to 220) V			
(10 to 20) Hz	12 mV		
(20 to 40) Hz	3.6 mV		
40 Hz to 20 kHz	1.7 mV		
(20 to 50) kHz	2.8 mV		
(50 to 100) kHz	5.3 mV		
(100 to 300) kHz	13 mV		
(300 to 500) kHz	32 mV		
500 kHz to 1 MHz	68 mV		
220 V to 1.1 kV			
(10 to 40) Hz	0.12 V		
(40 Hz to 1 kHz	39 mV		
1 kHz to 20 kHz	19 mV		
220 V to 750 V			
(20 to 50) kHz	53 mV		
(50 to 100) kHz	0.12 V		
		Fluke 5700A Series II	

I. Electromagnetic - DC/Low Frequency

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
AC Current – Source ⁹	220 µA to 2.2 mA		Fluke 5700A Series II
	(10 to 20) Hz	75 nA	
	(20 to 40) Hz	46 nA	
	40 Hz to 1 kHz	36 nA	
	(1 to 5) kHz	72 nA	
	(5 to 10) kHz	0.29 µA	
	(2.2 to 22) mA		
	(10 to 20) Hz	3 µA	
	(20 to 40) Hz	0.38 µA	
	40 Hz to 1 kHz	0.31 µA	
	(1 to 5) kHz	0.55 µA	
	(5 to 10) kHz	2.8 µA	
	(22 to 220) mA		
	(10 to 20) Hz	6.3 µA	
	(20 to 40) Hz	3.8 µA	
40 Hz to 1 kHz	3.0 µA		
(1 to 5) kHz	4.9 µA		
(5 to 10) kHz	27 µA		
220 mA to 2.2 A			
(10 to 20) Hz	63 µA		
(20 to 40) Hz	38 µA		
40 Hz to 1 kHz	30 µA		
(1 to 5) kHz	47 µA		
(5 to 10) kHz	0.22 mA		
(2.2 to 10) A			
30 Hz to 5 kHz	2.3 mA	with Fluke 5220A Amplifier	
AC Current – Measure ⁹	(Up to 100) µA		HP 3458A Opt 002
	(10 to 20) Hz	0.5 µA	
	(20 to 45) Hz	0.21 µA	
	(45 to 100) Hz	1 µA	
	100 Hz to 5 kHz	1 µA	
	100 µA to 1 mA		
	(10 to 20) Hz	4.8 µA	
	(20 to 45) Hz	2 µA	
	(45 to 100) Hz	0.93 µA	
	100 Hz to 5 kHz	0.59 µA	
	(5 to 20) kHz	0.93 µA	
	(20 to 50) kHz	5.1 µA	
	(1 to 10) mA		
	(10 to 20) Hz	49 µA	
	(20 to 45) Hz	20 µA	
	(45 to 100) Hz	9.3 µA	
	100 Hz to 5 kHz	5.9 µA	
	(5 to 20) kHz	9.3 µA	
(20 to 50) kHz	51 µA		
(50 to 100) kHz	81 µA		

I. Electromagnetic - DC/Low Frequency

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
AC Current – Measure ⁹ (cont.)	10 to 100) mA (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz (50 to 100) kHz (0.1 to 1) A (10 to 20) Hz (20 to 45) Hz (45 to 100) Hz 100 Hz to 5 kHz (5 to 20) kHz (20 to 50) kHz	0.48 mA 0.2 mA 93 μA 59 μA 93 μA 0.51 mA 0.81 mA 4.9 mA 2.1 mA 1.2 mA 1.4 mA 3.7 mA 12 mA	HP 3458A Opt 002
Resistance – Source ⁹	1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1 kΩ 1.9 kΩ 10 kΩ 19 kΩ 100 kΩ 190 kΩ 1 MΩ 1.9 MΩ 10 MΩ 19 MΩ 100 MΩ	17 μΩ 18 μΩ 17 μΩ 50 μΩ 0.29 mΩ 0.36 mΩ 0.28 mΩ 2.4 mΩ 5.8 mΩ 21 mΩ 82 mΩ 0.12 Ω 2.4 Ω 4.7 Ω 24 Ω 0.11 kΩ 0.29 kΩ	Fluke 5450A Resistance Calibrator
Resistance – Source ⁹ (cont.)	1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ	700 Ω 59 kΩ 0.7 MΩ	Biddle 72-6345-1 Mega Deck
Resistance - Measure ⁹	Up to 10 Ω (10 to 100) Ω 100 Ω to 1 kΩ (1 to 10) kΩ (10 to 100) kΩ 100 kΩ to 1 MΩ (1 to 10) MΩ (10 to 100) MΩ 100 MΩ to 1 GΩ	0.25 mΩ 2.4 mΩ 14 mΩ 0.14 Ω 1.5 Ω 12 Ω 0.7 kΩ 59 kΩ 0.7 MΩ	HP 3458A Opt 002

I. Electromagnetic - DC/Low Frequency

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
Capacitance - Source ⁹ @ 1kHz	100 pF to 1 000 nF	3.4 µF/F	GenRad 1423A
	1 pF	2 fF	HP 16380A
	10 pF	20 fF	
	100 pF	2 pF	
	1 000 pF	20 pF	
Inductance - Source ⁹ @ 1kHz	100 µH	0.3 µH	GenRad 1482-B
	100 mH	0.13 mH	GenRad 1482-L
	1 H	1.3 mH	GenRad 1482-P

II. Electromagnetic - RF/Microwave

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
RF Power – Source ⁹	1 µW to 100 mW 100 kHz to 50 GHz	0.35 mW	HP 3325B Function Generator, HP 8341B Generator HP 83640B Generator
RF Power – Measure ⁹	1 µW to 100 mW 100 kHz to 50 GHz	0.35 mW	HP E4419B with HP 8482A, HP 8481A, Agilent 8487A Agilent 11667C Power Splitter
Tuned RF Level ⁹	2.5 MHz to 26.5 GHz (+10 to -22) dB (-22 to -42) dB (-42 to -50) dB (-50 to -60) dB (-60 to -72) dB (-72 to -80) dB (-80 to -92) dB (-92 to -102) dB (-102 to -110) dB (-110 to -120) dB (-120 to -127) dB	0.17 dB 0.18 dB 0.2 dB 0.21 dB 0.22 dB 0.23 dB 0.24 dB 0.27 dB 0.28 dB 0.31 dB 0.34 dB	HP 8902A with 11792A, 11973A, and 11722A
Distortion - Measure ^{5,9} Fundamental Frequency	20 Hz to 20 kHz (20 to 100) kHz	1.3 dB 2.6 dB	HP 8903B
RF Harmonic Distortion ⁹	Up to 26 GHz (-60 to 10) dB	1.2 dB	HP 8590L, HP 8562A
Spurious Signals ⁹	Up to 26 GHz (-60 to 10) dB	1.2 dB	

II. Electromagnetic - RF/Microwave

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(\pm)]	Reference Standard or Equipment
Amplitude Modulation ⁹	Depth to 99 % Rates 50 Hz to 50 kHz Freq 150 kHz to 1.3 GHz	1.3 %	HP 8902A
Frequency Modulation ⁹	Freq 250 kHz to 1.3 GHz Rates 20 Hz to 100 kHz	1.3 kHz	

III. Time & Frequency

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(\pm)]	Reference Standard or Equipment
Frequency – Source ⁹	Fixed 10 MHz	2 parts in 10^{11} MHz	HP 58503 GPS Receiver
Frequency – Measure ⁹	DC to 500 MHz 300 MHz to 40 GHz	2 parts in 10^{11} MHz 1 part in 10^8 MHz	HP 53131A HP 5345A, HP 5352B Opt 001

IV. Thermodynamic

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(\pm)]	Reference Standard or Equipment
Humidity Source and Measure	(0 to 80) %RH	1 %RH	Rotronic HygroPalm Lunaire Environmental Chamber
Temperature Source	-77 °C (-25 to 150 °C) (-55 to ambient) °C	0.03 °C	Dry Ice/ Alcohol Bath Neslab Bath Thermotron Chamber
Temperature Measure ⁹	(-197 to 0) °C (0 to 232) °C (232 to 500) °C	0.025 °C 0.03 °C 0.035 °C	Hart Scientific 5608 SPRT HP 3458A opt 002

V. Mechanical

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(\pm)]	Reference Standard or Equipment
Pressure ⁹	(10 to 18 000) psi	0.0053 % of reading	DHI Deadweight Pressure System

V. Mechanical

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
Torque Transducers	(0.5 to 400) ozf-in (5 to 100) lbf-in (20 to 200) lbf-in (75 to 750) lbf-in (100 to 1 000) lbf-ft	0.03 lbf-in 0.06 lbf-in 0.09 lbf-in 0.27 lbf-in 7.3 lbf-in	Weights, Butterfly Wheels, 40 in Torque Arms
Force ⁹ Compression / Tension Source And Measure	(200 to 2 000) lbf (230 to 2 000) lbf (2 000 to 10 000) lbf	1.3 lbf 1.4 lbf 24 lbf	Morehouse Proving Rings
Mass	(1 to 1000) mg 1 g (2 to 3) g 4 g (5 to 6) g 10 g (20 to 50) g 100 g 200 g 300 g 500 g 1 kg 2 kg (4 to 5) kg 10 kg	42 µg 40 µg 78 µg 0.1 mg 42 µg 78 µg 50 µg 58 µg 65 µg 0.11 mg 4.6 mg 28 mg 30 mg 34 mg 1.6 mg	Voland Double Pan Balance Class 1 Weights

VI. Dimensional

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(±)]	Reference Standard or Equipment
Gage Blocks	0.01 to 1 in 2 in 3 in 4 in (4 to 10) in	2.7 µin 3.8 µin 4.7 µin 5.9 µin 5.9 µin + 1.1 µin/in	Gage Block Comparator
Height Gages ⁹	Up to 6 in (6 to 12) in (12 to 24) in (24 to 35) in	2.4 µin 2.4 µin + 0.89 µin/L in 13 µin + 34 µin/L in 840 µin + 13 µin/L in	Gage Blocks, End Measuring Rods
Calipers ⁹	Up to 6 in (6 to 12) in (12 to 24) in (24 to 35) in	58 µin 58 µin + 0.1 µin/in 59 + 33 µin/in 850 µin + 11 µin/in	
Micrometers ⁹	Up to 1 in (1 to 6) in	58 µin 58 µin + 0.02 µin/in	Gage Blocks, End Measuring Rods

VI. Dimensional

Parameter/ Equipment	Range	Calibration and Measurement Capability [Expressed as Uncertainty(\pm)]	Reference Standard or Equipment
Dial Indicators ⁹	Up to 3 in	20 μ in	
Surface Plates ⁹ Overall Flatness	Up to 36 in 36 in to 10 ft	110 μ in 220 μ in	Electronic Levels
Cylindrical OD	(0.000001 to 8) in	6.4 μ in + 1.38 μ in/in	Bench Micrometer Gage Blocks
Cylindrical ID	0.04 to 8 in	6.8 μ in + 0.93 μ in/in	Internal Comparator, Gage Blocks
Thread Gages	Up to 8 in	96 μ in	Bench Micrometer, Gage Blocks, Thread Wires

Notes:

1. Calibration and Measurement Capabilities (CMC) (Expanded Uncertainties) are based on approximately a 95 % confidence level, using a coverage of $k=2$.
2. This laboratory performs calibrations in the laboratory and at customer-designated locations (on-site). CMCs are stated for calibrations performed at the laboratory's permanent facility. Since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
3. Electromagnetic CMCs do not include possible contributions to uncertainty caused by a "best available" unit under test.
4. RF/Microwave CMCs do not include mismatch.
5. The term (L) represents Length and (D) represents Diagonal Length, both in inches.
6. The term (I) refers to Applied Current.
7. The expression (Vin) signifies Applied Voltage.
8. CMCs expressed as a percentage indicate percent of reading.
9. On-site calibration is available for this parameter.
10. This scope is formatted as part of a single document including the Certificate of Accreditation No. AC-1215.



 Vice President