



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

LIBERTY LABS, INC.

Kimballton, IA

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. 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 8 January 2009*).

Presented this 16th day of March 2010.



A handwritten signature in black ink, appearing to read "Peter Meyer".

President & CEO
For the Accreditation Council
Certificate Number 2123.01
Valid to October 31, 2011

For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005
& NCSL/ANSI Z540-1-1994

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CALIBRATION

Valid To: October 31, 2011

Certificate Number: 2123.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations¹:

I. Electrical – RF/Microwave

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
ISN – Insertion Loss	150 kHz to 80 MHz	0.36 dB	CISPR 16-1-2 Annex E CISPR 22:2005, Ed 5
Impedance	150 kHz to 80 MHz	0.14 dB	HP8751A HP87512A E5071C 4395A



Parameter/Equipment	Frequency	CMC ^{3,5,6} (\pm)	Comments
LISN ⁴ – Insertion Loss T Connection Through Connection Impedance	9 kHz to 108 MHz (108 to 400) MHz 9 kHz to 108 MHz (108 to 400) MHz 9 kHz to 100 MHz (100 to 200) MHz (200 to 400) MHz	0.66 dB + <i>M</i> 0.86 dB + <i>M</i> 0.68 dB + <i>M</i> 0.88 dB + <i>M</i> $\pm 0.2 \Omega$ $\pm 0.7 \Omega$ $\pm 1.2 \Omega$	ANSI C63.4, Appendix E HP 8751A, 87512A, BNC and Type “N” calibration standards
RF Power, Absolute ⁴ – Measure 9 kHz to 6000 MHz 50 MHz to 50 GHz	(-30 to -20) dBm (-20 to -10) dBm (-10 to 0) dBm (0 to 10) dBm (10 to 20) dBm (-30 to 20) dBm (-70 to -20) dBm	0.9 % + <i>M</i> 0.8 % + <i>M</i> 0.65 % + <i>M</i> 0.55 % + <i>M</i> 0.45 % + <i>M</i> 0.8 % + <i>M</i> 1.4 % + <i>M</i>	Power meter w/ sensor E9304 HP 8487A HP 8487A
RF Power ⁴ – Generate	9 kHz to 2.5 GHz (2.5 to 3.2) GHz (3.2 to 4) GHz 1 Hz to 15 MHz 10 MHz to 2 GHz @ ≥ -10 dBm (2 to 20) GHz (20 to 40) GHz	1 dB 1.5 dB 2 dB 0.1 dB 0.6 dBm 0.7 dBm 0.9 dBm	HP 8648D signal generators HP 33120° HP 83640L

Parameter/Equipment	Frequency	CMC ^{3,5,6} (±)	Comments
Current Probes ⁴ & Bulk Current Injection Probes ⁴ –			CISPR 16-1-2, Section 5 and EN 61000-4-6
Insertion Loss	5 Hz to 500 MHz (500 to 1000) MHz	0.77 dB + <i>M</i> 1.1 dB + <i>M</i>	HP 8751A, 87512A, BNC and Type “N” calibration standards
Transfer Impedance	5 Hz to 500 MHz (500 to 1000) MHz	0.77 dB + <i>M</i> 1.1 dB + <i>M</i>	
CDN’s and Adapters ⁴ – (50 to 150) Ω			EN 61000-4-6 with
Adapter Insertion Loss	10 kHz to 230 MHz	1.2 dB + <i>M</i>	HP 8751A, 87512A, BNC and Type “N” calibration standards
Coupling Factor	10 kHz to 230 MHz	1.1 dB + <i>M</i>	
Impedance	10 kHz to 230 MHz	0.39 %	
Rod Antennas ⁴ (ECSM)–			CISPR 25, ANSI C63.5, SAE ARP 958 (ECSM) using HP 8751A, 87512A, BNC calibration standards
Antenna Factor	10 Hz to 60 MHz	0.23 dB	
Loop Antennas ⁴	1 kHz to 30 MHz	0.32 dB	Standard field using vacuo junction
	20 Hz to 500 kHz	0.34 dB	using series resistor to measure loop current
	20 Hz to 30 MHz	0.44 dB	by substitution
NSA Measurements ⁴			ANSI C63.4 CISPR 16-1-4
	(30 to 1000) MHz (1 to 18) GHz	0.5 dB 0.5 dB	HP 8591E and 8593EM
	(30 to 1000) MHz (30 to 6000) MHz	0.1 dB 0.2 dB	HP 8753D
	(30 to 1000) MHz (1 to 40) GHz	0.1 dB 0.2 dB	Agilent 8364B

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
Magnetic Meters	20 Hz to 500 kHz 20 Hz to 500 kHz	0.73 dB 0.73 dB	Helmholtz coil standard field
Absorbing Clamps	30 MHz to 1 GHz	2.4 dB	CISPR 16-1-3 HP 8593E
Injection Clamps	(0.01 to 300) MHz (300 to 1000) MHz	1.6 dB 1.6 dB	IEC 61000-4-6 HP 8593E
Antenna Pattern Measurements	(10 to 1000) MHz (1 to 40) GHz	0.87 dB 1 dB	HP E8364B PNA

Parameter/Equipment	Range	CMC ^{3,6} (±)	Comments
ESD Simulators –			IEC/EN 61000-4-2
Contact Voltage (positive and negative)	(2 to 30) kV	0.69 %	TDS 7404B scope
Rise Time	(0.6 to 1) ns	23 ps	MD 102 target
Peak Current	(6.8 to 33) A	2.8 %	20 dB attenuator
30 ns current	(2.8 to 20.8) A	3.8 %	
60 ns current	(1.4 to 10.4) A	9 %	
Air Discharge Voltage (positive and negative)	(0 to 25) kV	1.9 %	SAE J1113-13 ISO 10605
Rise Time	(0.7 to 1) ns	60 ps	TDS 7404B scope,
RC Time Constant (at ± 15 kV)	600 ns ± 130 ns (for 330 pF probe)	60 ps	
	300 ns ± 60 ns (for 150 pF probe)	60 ps	MD 102 target 20 dB attenuator
Indicated Voltage	(2 to 30) kV	0.69 %	Electrometer 6514 probe MHEP-1

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
RF Isotropic Probes ⁴	10 kHz to 1 GHz (0.1 to 18) GHz	0.71 dB 0.76 dB	IEEE 1309, GTEM/TEM/Stripline cell/Triplate chamber standard field & direct substitution
	10 kHz to 1 GHz (18 to 40) GHz	1.3 dB 1.9 dB	Stripline/Tri-Plate chamber standard field
	Isotropic Response/ Linearity	0.82 dB	Standard field
	Channel Match	0.98 dB	
RF Laser Probes –			
TEM Cell	9 kHz to 200 MHz Calculated Field	0.86 dB	IEEE 1309
	Correction Factor Linearity Isotropy	0.77 dB 0.77 dB 0.30 dB	
GTEM Cell	(200 to 1000) MHz Correction Factor Linearity Isotropy	0.68 dB 0.70 dB 0.40 dB	
Chamber	(1 to 18) GHz Correction Factor Linearity Isotropy	1.4 dB 0.75 dB 0.35 dB	
General RF Insertion Loss – S Parameters	20 Hz to 500 MHz 10 MHz to 50 GHz	0.15 dB 0.15 dB	IEEE 291, Agilent 8364B PNA
	10 Hz to 500 MHz (0.5 to 18) GHz	0.97 dB 0.97 dB	HP 8591E and 8593E
	(0.3 to 1000) MHz (1 to 6) GHz	0.2 dB 0.2 dB	HP 8753D

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
Electronic Field Probes	10 kHz to 5000 MHz Correction Factor (i.e. FP5000 probe type)	1.3 dB	IEEE 1309 via transfer standard
	10 kHz to 5000 MHz Linearity Factor (i.e. FP5000 probe type)	0.83 dB	
	10 kHz to 5000 MHz Channel Match Factor (i.e. FP5000 probe type)	1 dB	
	(200 to 1000) MHz Isotropic Response	0.83 dB	
	80 MHz to 18 GHz Correction Factor (i.e. FP2080 probe type)	1.9 dB	
	80 MHz to 18 GHz Linearity Factor (i.e. FP2080 probe type)	0.84 dB	
	80 MHz to 18 GHz Channel Match Factor (i.e. FP2080 probe type)	1 dB	
RF Pre-Amps and Amplifiers	10 kHz to 18 GHz (18 to 40) GHz	0.97 dB 1 dB	IEEE 291, HP 8591E 8593E and E8364B PNA

Parameter/Range	Range	CMC ^{3,5} (\pm)	Comments
Reflection S_{11}/S_{22} – Measure			
(100 to 300) kHz	(0.5 to 1) LIN (0.1 to 0.5) LIN (0 to 0.1) LIN	$M + 0.1$ (LIN) $M + 0.05$ (LIN) $M + 0.05$ (LIN)	HP 8753D w/ 85032B cal kit
300 kHz to 6 GHz	(0.56 to 1) LIN (0.32 to 0.56) LIN (0.1 to 0.32) LIN (0.032 to 0.1) LIN (0.001 to 0.032) LIN (0 to 0.001) LIN	$M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN)	
10 MHz to 18 GHz	(0.6 to 1) LIN (0.32 to 0.66) LIN (0.1 to 0.32) LIN (0.032 to 0.1) LIN (0 to 0.032) LIN	$M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN)	Agilent E8364B PNA w/ electronic cal
(18 to 50) GHz	(0.6 to 1) LIN (0.32 to 0.6) LIN (0.1 to 0.32) LIN (0.032 to 0.1) LIN (0 to 0.032) LIN	$M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN) $M + 0.1$ (LIN)	
Transmission S_{12}/S_{21} – Measure			
300 kHz to 6 GHz	(0 to 12) dB (12 to 30) dB (30 to 40) dB (40 to 50) dB (50 to 60) dB (60 to 70) dB	$M + 0.07$ dB/0.1° $M + 0.07$ dB/0.1° $M + 0.08$ dB/0.1° $M + 0.09$ dB/0.1° $M + 0.1$ dB/0.1° $M + 0.15$ dB/0.1°	HP 8753D w/ 85032B cal kit
10 MHz to 18 GHz	(0 to 12) dB (12 to 30) dB (30 to 40) dB (40 to 50) dB (50 to 60) dB (60 to 70) dB	$M + 0.05$ dB/0.1° $M + 0.07$ dB/0.1° $M + 0.07$ dB/0.1° $M + 0.08$ dB/0.1° $M + 0.08$ dB/0.1° $M + 0.15$ dB/0.1°	Agilent E8364B PNA w/ electronic cal

Parameter/Equipment	Range	CMC ^{3,5} (±)	Comments
Transmission S ₁₂ /S ₂₁ – Measure (cont) (18 to 50) GHz	(0 to 12) dB (12 to 30) dB (30 to 40) dB (40 to 50) dB (50 to 60) dB (60 to 70) dB	<i>M</i> + 0.15 dB/0.1° <i>M</i> + 0.15 dB/0.1° <i>M</i> + 0.15 dB/0.1° <i>M</i> + 0.25 dB/0.1° <i>M</i> + 0.25 dB/0.1° <i>M</i> + 0.25 dB/0.1°	Agilent E8364B PNA w/ electronic cal

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
Conical Log Spirals – 1 meter	(200 to 400) MHz (400 to 1000) MHz (1000 to 10 000) MHz	2.2 dB 0.88 dB 1.7 dB	SAE ARP958 w/ Agilent N5230A PNA w/ electronic cal
High Precision Dipole Calibrations on Site 1 –	Horizontal (30 to 60) MHz (50 to 150) MHz (140 to 400) MHz (400 to 1000) MHz	0.35 dB 0.5 dB 1.5 dB 1.8 dB	ANSI C63.5-1988 ANSI C63.5-1998 ANSI C63.5 w/ HP 8591E and 8593E
3 & 10 Meters using standard dipole sets (i.e. EMCO 3121) on Site 1 GND Plane	Horizontal/Vertical (30 to 1000) MHz	0.31 dB	ANSI C63.5-1988 ANSI C63.5-1998 ANSI C63.5 w/ HP 8591E and 8593E
3 Meters using High Precision Dipoles (i.e. NIST Fitzgerald, NPL, Austrian Research) on 50 × 80 square meter GND plane ⁴	Horizontal (30 to 60) MHz (50 to 150) MHz (140 to 400) MHz (400 to 1000) MHz	0.3 dB 0.36 dB 0.43 dB 0.39 dB	ANSI C63.5-1988 ANSI C63.5-1998 ANSI C63.5 w/ HP 8591E and 8593E

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
10 Meters using High Precision Dipoles (i.e. NIST Fitzgerald, NPL, Austrian Research) on 50 × 80 square meter GND plane ⁴	Horizontal (30 to 60) MHz (50 to 150) MHz (140 to 400) MHz (400 to 1000) MHz	0.32 dB 0.39 dB 0.46 dB 0.43 dB	ANSI C63.5 w/ HP 8591E and 8593E
3 & 10 Meters using standard dipole sets (i.e. EMCO 3121) on 50 × 80 square meter GND plane ⁴	Horizontal/Vertical (30 to 1000) MHz	0.25 dB	ANSI C63.5-1988 ANSI C63.5-1998 ANSI C63.5 w/ HP 8591E and 8593E
Biconical Antennas ⁴ –			
1 Meter Distance	(30 to 70) MHz (70 to 200) MHz (200 to 300) MHz	0.33 dB 0.34 dB 0.37 dB	SAE ARP958 w/ Agilent N5230A PNA
3 Meter Distance	(30 to 70) MHz (70 to 200) MHz (200 to 300) MHz	0.37 dB 0.48 dB 0.37 dB	SAE ARP958 Appendix C Agilent N5230A PNA
3 Meters	(30 to 70) MHz (70 to 200) MHz (200 to 300) MHz	0.33 dB 0.48 dB 0.37 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 using 3-antenna method on Site 1 w/ Agilent N5230A PNA
3 Meters	(30 to 72.5) MHz (72.5 to 115) MHz (115 to 157.5) MHz (157.5 to 200) MHz (200 to 300) MHz	0.3 dB 0.25 dB 0.2 dB 0.3 dB 0.4 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 using 3-antenna method on (50 × 80) square meter ground plane w/ Agilent N5230A PNA
10 Meters	(30 to 72.5) MHz (72.5 to 115) MHz (115 to 157.5) MHz (157.5 to 200) MHz (200 to 300) MHz	0.4 dB 0.35 dB 0.3 dB 0.3 dB 0.5 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 using 3-antenna method on (50 × 80) square meter ground plane w/ N5230A PNA

Parameter/Equipment	Frequency	CMC ³ (±)	Comments	
Biconical Antennas ⁴ – (cont)				
3 Meters	(30 to 72.5) MHz (72.5 to 115) MHz (115 to 157.5) MHz (157.5 to 200) MHz (200 to 300) MHz	0.3 dB 0.2 dB 0.3 dB 0.3 dB 0.35 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 using identical antenna method on (50 × 80) square meter ground plane w/ N5230A PNA	
10 Meters	(30 to 72.5) MHz (72.5 to 115) MHz (115 to 157.5) MHz (157.5 to 200) MHz (200 to 300) MHz	0.35 dB 0.25 dB 0.35 dB 0.3 dB 0.35 dB		
3 Meters	(30 to 72.5) MHz (72.5 to 115) MHz (115 to 157.5) MHz (157.5 to 200) MHz (200 to 300) MHz	0.2 dB 0.25 dB 0.35 dB 0.3 dB 0.45 dB		
10 Meters	(30 to 72.5) MHz (72.5 to 115) MHz (115 to 157.5) MHz (157.5 to 200) MHz (200 to 300) MHz	0.25 dB 0.3 dB 0.4 dB 0.45 dB 0.45 dB		
Log-Periodic Antennas ⁴ –				
1 Meter Distance	(200 to 400) MHz (400 to 1000) MHz (1000 to 5000) MHz	0.32 dB 0.38 dB 0.52 dB		SAE ARP958 w/ N5230A PNA
3 Meter Distance	(200 to 400) MHz (400 to 1000) MHz (1000 to 5000) MHz	0.38 dB 0.45 dB 0.58 dB		SAE ARP958, Appendix C
3 Meters	(200 to 300) MHz (300 to 400) MHz (400 to 500) MHz (500 to 600) MHz (600 to 700) MHz (700 to 800) MHz (800 to 900) MHz (900 to 1000) MHz (1000 to 5000) MHz	0.3 dB 0.3 dB 0.4 dB 0.4 dB 0.4 dB 0.5 dB 0.5 dB 0.6 dB 0.7 dB		ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5; using 3-antenna method on (50 × 80) square meter ground plane w/ N5230A PNA

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
Log-Periodic Antennas ⁴ – (cont)			
10 Meters	(200 to 300) MHz (300 to 400) MHz (400 to 500) MHz (500 to 600) MHz (600 to 700) MHz (700 to 800) MHz (800 to 900) MHz (900 to 1000) MHz (1000 to 5000) MHz	0.3 dB 0.3 dB 0.4 dB 0.4 dB 0.4 dB 0.5 dB 0.5 dB 0.6 dB 0.7 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5; using 3-antenna method on (50 × 80) square meter ground plane w/ N5230A PNA
3 Meters	(200 to 300) MHz (300 to 400) MHz (400 to 500) MHz (500 to 600) MHz (600 to 700) MHz (700 to 800) MHz (800 to 900) MHz (900 to 1000) MHz (1000 to 5000) MHz	0.5 dB 0.6 dB 0.6 dB 0.6 dB 0.7 dB 0.7 dB 0.8 dB 0.9 dB 1.3 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5; using identical antenna method on Site 1 w/ N5230A PNA
10 Meters	(200 to 300) MHz (300 to 400) MHz (400 to 500) MHz (500 to 600) MHz (600 to 700) MHz (700 to 800) MHz (800 to 900) MHz (900 to 1000) MHz (1000 to 5000) MHz	0.6 dB 0.6 dB 0.7 dB 0.6 dB 0.7 dB 0.8 dB 0.9 dB 1 dB 1.5 dB	
3 Meters	(200 to 300) MHz (300 to 400) MHz (400 to 500) MHz (500 to 600) MHz (600 to 700) MHz (700 to 800) MHz (800 to 900) MHz (900 to 1000) MHz (1000 to 5000) MHz	0.2 dB 0.2 dB 0.2 dB 0.25 dB 0.35 dB 0.45 dB 0.45 dB 0.5 dB 0.6 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 using identical antenna method on (50 × 80) square meter ground plane w/ N5230A PNA

Parameter/Equipment	Frequency	CMC ³ (±)	Comments
Log-Periodic Antennas ⁴ – (cont)			
10 Meters	(200 to 300) MHz (300 to 400) MHz (400 to 500) MHz (500 to 600) MHz (600 to 700) MHz (700 to 800) MHz (800 to 900) MHz (900 to 1000) MHz (1000 to 5000) MHz	0.3 dB 0.3 dB 0.3 dB 0.3 dB 0.45 dB 0.45 dB 0.55 dB 0.6 dB 0.7 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 using identical antenna method on (50 × 80) square meter ground plane w/ N5230A PNA
Bilog Antennas ⁴ –			
1 Meter Distance	(30 to 70) MHz (70 to 200) MHz (200 to 400) MHz (400 to 1000) MHz (1000 to 2000) MHz	0.5 dB 0.76 dB 0.91 dB 0.74 dB 0.75 dB	SAE ARP958 w/ N5230A PNA
3 Meter Distance	(30 to 70) MHz (70 to 200) MHz (200 to 400) MHz (400 to 1000) MHz (1000 to 2000) MHz	0.11 dB 0.11 dB 0.19 dB 0.26 dB 0.41 dB	SAE ARP958, Appendix C
3 & 10 Meter Distance	(20 to 1000) MHz (1000 to 6000) MHz	0.58 dB 0.75 dB	using 3-antenna method on Site 1
	(20 to 1000) MHz (1000 to 6000) MHz	0.58 dB 0.75 dB	using 3-antenna method on (50 × 80) square meter ground plane
	(20 to 1000) MHz (1000 to 6000) MHz	0.68 dB 0.89 dB	using identical antenna method on Site 1
	(20 to 1000) MHz (1000 to 6000) MHz	0.68 dB 0.89 dB	using identical antenna method on (50 × 80) square meter ground plane

Parameter/Equipment	Frequency	CMC ^{3,5} (±)	Comments
Horn Antennas – (e.g. EMCO 3115)	700 MHz to 40 GHz	0.5 dB	ANSI C63.5-1988, ANSI C63.5-1998, ANSI C63.5 with SAE ARP958, SAE ARP958, Appendix C HP 8591E, 8593EM, E8364B PNA and 8753E,
1 Meter & 3 Meter Distances	700 MHz to 40 GHz	0.69 dB	using identical antenna method on an OATS in anechoic room using standard field antenna method in an anechoic room
(1 to 3) Meter Distances	700 MHz to 40 GHz	1.3 dB	using substitution method
	700 MHz to 18 GHz	0.37 dB	using 3-antenna method
	(18 to 26.5) GHz	0.42 dB	
	(26.5 to 40) GHz	0.47 dB	

ELECTRICAL (Automotive EMC)

In recognition of the successful completion of the A2LA Laboratory Accreditation Program evaluation process, accreditation is granted this laboratory to perform the following automotive electromagnetic compatibility tests:

Test Technology

Test Method(s)

Electric Vehicle
Conducted Emissions
Radiated Emissions

SAE J551-5
(Utilizing HP8593EM, EMCO 3301B Rod Antenna,
EMCO 6502 Loop Antenna, EMCO 3825/2 LISN)

¹ This laboratory offers commercial and field calibration service.

² Calibration and Measurement Capability (CMC) represents an expanded uncertainty corresponding to a 95.45 % level of confidence using a coverage factor, k. Values of k other than 2 were approximated by a t-distribution with the effective degrees of freedom, v_{eff} , obtained from the Welch-Satterthwaite formula.

- ³ Calibration and Measurement Capability (CMC) is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer's device and to influences from the circumstances of the specific calibration.
- ⁴ Field calibration service is available for this calibration and this laboratory meets A2LA R104 – General Requirements: Accreditation of Field Testing and Field Calibration Laboratories for these calibrations. Please note the actual measurement uncertainties achievable on a customer's site can normally be expected to be larger than the CMC found on the A2LA Scope. Allowance must be made for aspects such as the environment at the place of calibration and for other possible adverse effects such as those caused by transportation of the calibration equipment. The usual allowance for the actual uncertainty introduced by the item being calibrated, (e.g. resolution) must also be considered and this, on its own, could result in the actual measurement uncertainty achievable on a customer's site being larger than the CMC.
- ⁵ In the statement of CMC, M is the Mismatch error due to connections of device to other devices in actual use by the user.
- ⁶ In the statement of CMC, all percentages are to be read as percent of reading unless noted otherwise.