



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017
& ANSI/NCSL Z540-1-1994

DIVERSIFIED TECHNICAL SYSTEMS, INC
25881 Meadowbrook Rd
Novi, MI 48375
Roger Briggs Phone: 248 513 6050

CALIBRATION

Valid To: May 31, 2022

Certificate Number: 3007.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above as well as the satellite laboratory location below to perform the following calibrations^{1,6}:

I. Dimensional

Parameter/Equipment	Range	CMC ² (±)	Comments
Velocity Measurement System ³ – Length (1D)	Up to 8 in (8 to 24) in (24 to 60) in	0.014 in 0.026 in 0.028 in	Vernier calipers

II. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage ³ – Measure	Up to 1.2 mV (1.2 to 12) mV (12 to 120) mV (0.12 to 1.2) V (1.2 to 12) V (12 to 120) V	0.018 % + 0.023 μV 0.0085 % + 0.034 μV 0.0052 % + 0.46 μV 0.0045 % + 4.6 μV 0.0035 % + 46 μV 0.0041 % + 0.57 mV	Agilent 34420A
DC Voltage ³ – Generate	(1 to 10) V	0.20 mV	Agilent 33120A

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Current ³ – Measure	Up to 1.2 mA (1.2 to 12) mA (12 to 120) mA	0.23 % + 0.068 μA 0.07 % + 2.3 μA 0.057 % + 5.7 μA	Agilent 34420A
	(0 to 1) A (1 to 3) A	4.0 mA 5.1 mA	Cal Station 2
Resistance ³ – Measure	Up to 1.2 Ω (1.2 to 12) Ω (12 to 120) Ω (0.12 to 1.2) kΩ (1.2 to 12) kΩ (12 to 120) kΩ (0.12 to 1.2) MΩ	0.0080 % + 2.3 μΩ 0.0068 % + 23 μΩ 0.0069 % + 0.23 mΩ 0.0069 % + 2.3 mΩ 0.0069 % + 23 mΩ 0.0069 % + 0.46 Ω 0.0081 % + 4.6 Ω	Agilent 34420A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage ³ – Measure			
Up to 120 mV	10 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.07 % + 68 μV 0.069 % + 34 μV 0.12 % + 57 μV 0.46 % + 91 μV 1.4 % + 0.57 mV	Agilent 34410A
(0.12 to 1.2) V	10 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.068 % + 0.37 mV 0.069 % + 0.34 mV 0.11 % + 0.57 mV 0.46 % + 0.91 mV 1.4 % + 57 mV	
(1.2 to 12) V	10 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.068 % + 3.4 mV 0.069 % + 3.4 mV 0.11 % + 5.7 mV 0.46 % + 9.1 mV 1.4 % + 57 mV	

III. Mechanical

Parameter/Equipment	Range	CMC ^{2,5,7} (±)	Comments
Angular Rate ³ – Measuring Equipment	(0 to 300) °/s (300 to 1500) °/s (1500 to 8000) °/s (8000 to 12 000) °/s	0.29 °/s 0.42 °/s 1.2 °/s 1.6 °/s	Agilent 34401A DTS rate table
Accelerometers – Shock	(100 to 1000) g	1.0 %	The Modal Shop K9525C with PCB 301A12
Acceleration Sensitivity, 2g Roll – Measure	(0.40 to 66) mV/g	0.11 %	NIST standard acceleration due to gravity and NOAA surface gravity prediction.

IV. Time & Frequency

Parameter/Range	Frequency	CMC ^{2,4,7} (±)	Comments
Frequency ³ – Generate, Fixed Points	20 Hz 1.0 kHz 20 kHz 50 kHz 100 kHz	0.009 Hz 0.1 Hz 2.0 Hz 5.0 Hz 11 Hz	Cal Station 2
Frequency ³ – Measuring Equipment	(1 to 1000) Hz	0.023 Hz	Agilent 33220A
Frequency ³ – Measure	(0 to 10) Hz (10 to 100) Hz (100 to 500) Hz 500 Hz to 1 kHz (1 to 10) kHz (10 to 100) kHz (100 to 300) kHz	0.0073 Hz 0.014 Hz 0.07 Hz 2.4 Hz 4.2 Hz 14 Hz 43 Hz	Agilent 34401A

SATELLITE FACILITY

DIVERSIFIED TECHNICAL SYSTEMS, INC
 3300 General Motors Rd
 Milford, MI 48380
 Roger Briggs Phone: 248 513 6050

CALIBRATION

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC ^{2,4} (±)	Comments
DC Voltage – Measure	Up to 1.2 mV (1.2 to 12) mV (12 to 120) mV (0.12 to 1.2) V (1.2 to 12) V (12 to 120) V	0.018 % + 0.023 μV 0.0085 % + 0.034 μV 0.0052 % + 0.46 μV 0.0045 % + 4.6 μV 0.0035 % + 46 μV 0.0041 % + 0.57 mV	Agilent 34420A
DC Voltage – Generate	(1 to 10) V	0.20 mV	Agilent 33120A
DC Current – Measure	Up to 1.2 mA (1.2 to 12) mA 12 to 120) mA (0 to 1) A (1 to 3) A	0.23 % + 0.068 μA 0.07 % + 2.3 μA 0.057 % + 5.7 μA 4.0 mA 5.1 mA	Agilent 34420A Cal Station 2
Resistance – Measure	Up to 1.2 Ω (1.2 to 12) Ω (12 to 120) Ω (0.12 to 1.2) kΩ (1.2 to 12) kΩ (12 to 120) kΩ (0.12 to 1.2) MΩ	0.008 % + 2.3 μΩ 0.0068 % + 23 μΩ 0.0069 % + 0.23 mΩ 0.0069 % + 2.3 mΩ 0.0069 % + 23 mΩ 0.0069 % + 0.46 Ω 0.0081 % + 4.6 Ω	Agilent 34420A

Parameter/Range	Frequency	CMC ^{2,4} (±)	Comments
AC Voltage – Measure			
Up to 120 mV	10 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.07 % + 68 μV 0.069 % + 34 μV 0.12 % + 57 μV 0.46 % + 91 μV 1.4 % + 0.57 mV	Agilent 34410A
(0.12 to 1.2) V	10 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.068 % + 0.37 mV 0.069 % + 0.34 mV 0.11 % + 0.57 mV 0.46 % + 0.91 mV 1.4 % + 57 mV	
(1.2 to 12) V	10 Hz to 1 kHz (1 to 20) kHz (20 to 50) kHz (50 to 100) kHz (100 to 300) kHz	0.068 % + 3.4 mV 0.069 % + 3.4 mV 0.11 % + 5.7 mV 0.46 % + 9.1 mV 1.4 % + 57 mV	

II. Mechanical

Parameter/Equipment	Range	CMC ^{2,5,7} (±)	Comments
Acceleration Sensitivity, 2g Roll – Measure	(0.40 to 66) mV/g	0.11 %	NIST standard acceleration due to gravity and NOAA surface gravity prediction.

III. Time & Frequency

Parameter/Range	Frequency	CMC ^{2,4,7} (±)	Comments
Frequency – Generate, Fixed Points	20 Hz 1.0 kHz 20 kHz 50 kHz 100 kHz	0.009 Hz 0.1 Hz 2.0 Hz 5.0 Hz 11 Hz	Cal Station 2

Parameter/Range	Frequency	CMC ^{2,4,7} (\pm)	Comments
Frequency – Measuring Equipment	(1 to 1000) Hz	0.023 Hz	Agilent 33220A
Frequency – Measure	(0 to 10) Hz (10 to 100) Hz (100 to 500) Hz 500 Hz to 1 kHz (1 to 10) kHz (10 to 100) kHz (100 to 300) kHz	0.0073 Hz 0.014 Hz 0.07 Hz 2.4 Hz 4.2 Hz 14 Hz 43 Hz	Agilent 34401A

¹ This laboratory offers commercial calibration service and field calibration service.

² Calibration and Measurement Capability Uncertainty (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. CMCs 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.

³ 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.

⁴ The stated measured values are determined using the indicated instrument (see Comments). This capability is suitable for the calibration of the devices intended to measure or generate the measured value in the ranges indicated. CMC's are expressed as either a specific value that covers the full range or as a percent or fraction of the reading plus a fixed floor specification.

⁵ In the statement of CMC, percentages are percentage of reading, unless otherwise indicated.

⁶ This scope meets A2LA's P112 Flexible Scope Policy.

⁷ The type of instrument or material being calibrated is defined by the parameter. This indicates the laboratory is capable of calibrating instruments that measure or generate the values in the ranges indicated for the listed measurement parameter.



Accredited Laboratory

A2LA has accredited

Diversified Technical Systems Inc.

Novi, MI

for technical competence in the field of

Calibration

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets ANSI/NCSL Z540-1-1994 and R205 – Specific Requirements: Calibration Laboratory Accreditation Program. 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 April 2017).



Presented this 21st day of October 2020.

A blue ink signature of a person, likely the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3007.01
Valid to May 31, 2022

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