SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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CALIBRATION

Valid To: August 31, 2027 Certificate Number: 2734.03

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with R205 – A2LA's Calibration Program Requirements), accreditation is granted to this laboratory to perform the following calibrations[1, 8]:

I. Electrical – DC/Low Frequency

Parameter/Equipment	Range	CMC[2, 6] (±)	Comments
AC Resistance – Measure[3]	(0 to 10) Ω	0.45 Ω	Agilent 33250A, 33610 Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32

II. Time & Frequency (Ultrasound Instrumentation – Dynaray Series)

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Receiver – Ultrasound Instrumentation[3] Frequency Response: Low Cutoff High Cutoff	(0.225 to 20) MHz	None, HP1M, HP2M, HP5M, HP10M, LP2M ≤ 2.2 % , All others ≤ 0.90 % None, BP1-5M, HP1M, LP2M, LP5M, LP10M, LP15M ≤ 6.5 % , All others ≤ 1.9 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC ABUXE127A

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Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Receiver – Ultrasound Instrumentation[3] (cont)			
Frequency Response:			
Bandwidth	(0.225 to 20) MHz	None, HP1M, HP2M, HP10M, LP2M, LP15M ≤ 2.5 % , All others ≤ 1.0 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC ABUXE127A
Center		None, ≤ 3.6 % , All others ≤ 1.8 %	
Linearity of Time Delays	Up to 50 µs	0.0063 %	
Gain Linearity	(0 to 80) dB	0.47 dB	
Channel Gain Variation	< 1.5 dB (Zetec)	0.65 dB	
Linearity of Vertical Display	(0 to 28) dB rel.	0.53 %	
Equivalent Input Noise	< 80 nV/√Hz	7.0 nV/√Hz	
Transmitter – Ultrasound Instrumentation[3]			
Voltage	(25 to 250) V	1.8 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC ABUXE127A, 50 ohms/10W load
Rise Time	Up to 50 ns	0.78 ns	
Duration	(25 to 1000) ns	0.46 ns	
Linearity of Time Delays	Up to 50 µs	0.070 %	

III. Time & Frequency (Ultrasound Instrumentation – Zircon-15, Zircon-18, Topaz16, Topaz32, Quartz)

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Receiver – Ultrasound Instrumentation[3]			Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC 10040371 (ZIF), ZETEC 10059869 (IPEX)
Frequency Response – Zircon-15, Zircon-18, Topaz32, Quartz:	Zircon-15 (0.50 to 15) MHz Zircon-18, Topaz32, Quartz (0.50 to 18) MHz		
Phased Array			
Low Cutoff		≤ 0.70 %	
High Cutoff		HP1M ≤ 3.2 % None, LP5M, LP10M, HP2M ≤ 2.4 % , All others ≤ 1.5 %	
Bandwidth		≤ 0.80 %	
Center		≤ 0.90 %	
Conventional			
Low Cutoff		≤ 0.70 %	
High Cutoff		HP1M ≤ 8.0 % , None, HP2M ≤ 5.2 % LP5M, LP10M, BP1-5M, BP2-10M ≤ 1.9 % , All others ≤ 0.90 %	
Bandwidth		≤ 0.90 %	
Center – Conventional		LP5M, HP1M ≤ 1.3 % , All others ≤ 1.0 %	

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Receiver – Ultrasound Instrumentation[3] (cont) Frequency Response – Topaz16: Phased Array Low Cutoff High Cutoff Bandwidth Center – Phased Array Conventional Low Cutoff High Cutoff Bandwidth Center	 (0.50 to 18) MHz	 ≤ 0.80 % None, LP2M, LP5M, LP10M, HP1M, HP2M ≤ 2.3 % , All others ≤ 1.4 % LP2M ≤ 1.1 % , All others ≤ 0.90 % None, LP2M, LP5M ≤ 1.4 % , All others ≤ 1.0 % ≤ 1.0 % None, HP1M, HP2M ≤ 6.5 % LP2M, LP5M, LP10M, HP5M, BP1-5M, BP5-18M ≤ 3.0 % , All others ≤ 1.7 % LP2M, BP5-18M, BP10-18M ≤ 1.6 % , All others ≤ 1.0 % None, LP2M, BP5-18M ≤ 1.9 % , All others ≤ 1.0 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC 10040371 (ZIF), 10059869 (IPEX)

Parameter/Equipment	Range[5]	CMC[2, 4, 5] (±)	Comments
Receiver – Ultrasound Instrumentation[3] (cont)			
Linearity of Time Delays	Up to 20 µs	0.014 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC 10040371 (ZIF), ZETEC 10059869 (IPEX)
Gain Linearity			
Phased Array	(0 to 70) dB	0.29 dB	
Conventional	(0 to 70) dB	0.27 dB	
Channel Gain Variation			
Phased Array	< 1.5 dB (Zetec)	0.40 dB	
Conventional	< 1.5 dB (Zetec)	0.38 dB	
Linearity of Vertical Display	28 dB rel.	0.36 %	
Equivalent Input Noise	< 80 nV/√Hz	3.3 nV/√Hz	
Transmitter – Ultrasound Instrumentation[3]			
Voltage			Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC 10040371 (ZIF), ZETEC 10059869 (IPEX) 50 ohms/10W load
Phased Array	(35 to75) V	2.0 %	
Conventional	(50 to 200) V	2.6 %	
Rise Time			
Phased Array	Up to 50 ns	0.57 ns	
Conventional	Up to 50 ns	0.34 ns	
Duration			
Phased Array	(25 to 500) ns	0.63 ns	
Conventional	(25 to 500) ns	0.56 ns	
Linearity of Time Delays	Up to 20 µs	0.051 %	

IV. Time & Frequency (Ultrasound Instrumentation – Topaz64, Emerald64)

Parameter/Equipment	Range	CMC[2, 4] (±)	Comments
Receiver – Ultrasound Instrumentation[3]			
Frequency Response:	(0.50 to 18) MHz		
Phased Array			
Low Cutoff		HP0.6M, LP2M, LP5M, LP10M, HP1M, BP1-5M: < ±6.5 % HP2M, BP1.75-7M, BP2-10M: < ±3.4 % All others: < ±1.7 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC 10040371 (ZIF) ZETEC 10059869 (IPEX)
High Cutoff		HP0.6M, LP2M, LP5M, LP10M, BP1-5M:< ±2.5 % All others: < ±1.1 %	
Bandwidth		HP0.6M, LP2M, LP5M, BP1-5M, BP5-10M: < ±3.6 % All others: < ±1.9 %	
Center		HP0.6M, LP2M, LP5M, LP10M, BP1-5M, BP1.75-7M: < ±4.3 % All others: < ±1.9 %	
Conventional			
Low Cutoff		LP2M, BP1-4M, BP1.125-4.5M, BP1.875-7.5M, BP5-20M, BP0.55-6M: < ±4.2 % All others: < ±3.0 %	
High Cutoff		LP2M, BP1-4M, HP3M: < ±2.1 % All others: < ±1.2 %	
Bandwidth		LP2M, BP1-4M, BP2-8M, BP5-20M, HP10M: < ±3.1 % All others: < ±2.0 %	
Center		LP2M, BP1-4M, BP1.125-4.5M, BP2-8M, HP10M, HP3M, BP0.55-6M: < ±3.7 % All others: < ±2.0 %	

Parameter/Equipment	Range[5]	CMC[2, 4, 5] (±)	Comments
Receiver – Ultrasound Instrumentation[3] (cont)			
Linearity of Time Delays	Up to 20 µs	0.088 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC attenuator 10040260, ZETEC 10040371 (ZIF), ZETEC 10059869 (IPEX)
Gain Linearity			
Phased Array	(0 to 70) dB	0.29 dB	
Conventional	(0 to 70) dB	0.27 dB	
Channel Gain Variation			
Phased Array	< 1.5 dB (Zetec)	0.41 dB	
Conventional	< 1.5 dB (Zetec)	0.37 dB	
Linearity of Vertical Display	28 dB rel.	1.2 %	
Equivalent Input Noise	< 80 nV/√Hz		
Phased Array		9.0 nV/√Hz	
Conventional		28 nV/√Hz	
Transmitter – Ultrasound Instrumentation[3]			
Voltage			
Phased Array	(10 to 75) V	2.2 %	Agilent 33250A, Tektronix TDS-3032 (A, B, or C), MDO3032, MDO32, ZETEC 10040371 (ZIF) ZETEC 10059869 (IPEX) 50 ohms/10W load
Conventional	(20 to 200) V	2.7 %	
Rise Time			
Phased Array	Up to 50 ns	0.57 ns	
Conventional	Up to 50 ns	0.34 ns	
Duration			
Phased Array	(25 to 500) ns	0.49 ns	
Conventional	(25 to 500) ns	0.57 ns	
Linearity of Time Delays	Up to 20 µs	0.056 %	

[1] This laboratory offers commercial 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. 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] In the statement of CMC, percentages represent percent of reading unless otherwise noted.

[5] References to decibels (dB) refer to dB in voltage.

[6] 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. CMCs 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.

[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.

[8] This scope meets A2LA's *P112 Flexible Scope Policy*.

Accredited Laboratory

A2LA has accredited

EDDYFI CANADA INC.

Quebec, QC, CANADA

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 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 23rd day of May 2025.

Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2734.03
Valid to August 31, 2027

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