

CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Teledyne LeCroy, Inc.

700 Chestnut Ridge Road Chestnut Ridge, NY 10977

Fulfills the requirements of

ISO/IEC 17025:2017

and national standard

ANSI/NCSL Z540-1-1994 (R2002)

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document. The current scope of accreditation can be verified at www.anab.org.

Jason Stine, Vice President

Expiry Date: 14 February 2026 Certificate Number: AC-2555









SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017 AND

ANSI/NCSL Z540-1-1994 (R2002)

Teledyne LeCroy, Inc.

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CALIBRATION

Valid to: February 14, 2026 Certificate Number: AC-2555

Electrical – DC/Low Frequency

Version 006 Issued: January 9, 2024

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
DC Voltage – Source	(0 to 330) mV (0.33 to 3.3) V (3.3 to 33) V (33 to 330) V (330 to 1 000) V	$47 \mu V/V + 3.3 \mu V$ $40 \mu V/V + 4.5 \mu V$ $40 \mu V/V + 39 \mu V$ $43 \mu V/V + 0.39 m V$ $43 \mu V/V + 1.2 m V$	Fluke 5500A Multi Product Calibrator
DC Voltage – Measure	(10 to 100) mV 100 mV to 1 V (1 to 10) V (10 to 100) V (100 to 1 000) V	$\begin{array}{c} 9~\mu V/V + 1.2~\mu V \\ 5.5~\mu V/V + 1.2~\mu V \\ 5.4~\mu V/V + 1.9~\mu V \\ 8.1~\mu V/V + 0.041~m V \\ 9.7~\mu V/V + 0.31~m V \end{array}$	HP 3458A w/ option 002 Multimeter
DC Current – Source	(0 to 3.2) mA (3.2 to 32) mA (32 to 320) mA 320 mA to 2.1 A (2.1 to 11) A	$0.1 \text{ mA/A} + 0.04 \mu\text{A}$ $80 \mu\text{A/A} + 0.22 \mu\text{A}$ $82 \mu\text{A/A} + 2.8 \mu\text{A}$ $0.24 \text{ mA/A} + 34 \mu\text{A}$ 0.47 mA/A + 0.26 mA	Fluke 5500A Multi Product Calibrator
DC Current – Measure	(10 to 100) μA (0.1 to 1) mA (1 to 10) mA (10 to 100) mA (0.1 to 1) A	$28 \mu A/A + 0.81 nA$ $26 \mu A/A + 5.6 nA$ $26 \mu A/A + 60 nA$ $42 \mu A/A + 0.52 \mu A$ $0.12 mA/A + 10 \mu A$	HP 3458A w/ option 002 Multimeter





Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
	(0 to 11) Ω	0.012 % of reading + 6.2 m Ω	
	$(11 \text{ to } 33) \Omega$	0.010 % of reading $+$ 0.012 Ω	
	$(33 \text{ to } 330) \Omega$	0.007 % o <mark>f rea</mark> ding + 0.012 Ω	
	$(0.33 \text{ to } 3.3) \text{ k}\Omega$	$0.007 \% \frac{\text{of reading} + 0.05 \Omega}{\text{of reading}}$	Fluke 5500A Multi Product
	$(3.3 \text{ to } 33) \text{ k}\Omega$	0.007 % of reading $+$ 0.47 Ω	Calibrator
Resistance – Source	$(33 \text{ to } 110) \text{ k}\Omega$	0.009 % of reading + 4.7 Ω	Cumorator
Resistance Bource	$(110 \text{ to } 330) \text{ k}\Omega$	0.01 % of reading + 4.7Ω	(2-wire mode from
	$(0.33 \text{ to } 3.3) \text{ M}\Omega$	0.012 % of reading + 43 Ω	$110 \text{ k}\Omega \text{ to } 330 \text{ M}\Omega)$
	$(3.3 \text{ to } 11) \text{ M}\Omega$	0.047 % of reading $+$ 0.43 k Ω	110 K22 to 330 W122)
	$(11 \text{ to } 33) \text{ M}\Omega$	0.1% of reading $+ 0.43 \text{ k}\Omega$	
	(33 to 110) $M\Omega$	0.4% of reading $+4.3 \text{ k}\Omega$	
	$(110 \text{ to } 330) \text{ M}\Omega$	0.4% of reading + $13 \text{ k}\Omega$	
	0 to 10 Ω	18 μΩ/Ω <mark>+</mark> 51 μΩ	
	$(10 \text{ to } 100) \Omega$	$18 \mu\Omega/\Omega + 0.5 \mathrm{m}\Omega$	
	$(0.1 \text{ to } 1) \text{ k}\Omega$	$13 \mu\Omega/\Omega + 0.5 \mathrm{m}\Omega$	
Resistance – Measure	$(1 \text{ to } 10) \text{ k}\Omega$	$13 \mu\Omega/\Omega + 5.2 \mathrm{m}\Omega$	HP 3458A w/ option 002
Resistance Wedsure	$(10 \text{ to } 100) \text{ k}\Omega$	$13 \mu\Omega/\Omega + 0.05\Omega$	Multimeter
	$(0.1 \text{ to } 1) \text{ M}\Omega$	$17 \mu\Omega/\Omega + 2.0 \Omega$	
	$(1 \text{ to } 10) \text{ M}\Omega$	$53 \ \mu\Omega/\Omega + 100 \ \Omega$	
	$(10 \text{ to } 100) \text{ M}\Omega$	0.055 % of reading + 1 k Ω	
	(1 to 33) mV		
	(10 to 45) Hz	0.3 % of reading + 20 μV	
	45 Hz to 10 kHz	0.12 % of reading + 16 μV	
AC Voltage – Source	(10 to 20) kHz	0.16 % of reading + 16 μV	
	(20 to 50) kHz	0.19 % of reading + 16 μV	
	(50 to 100) kHz	0.27 % of reading + 26 μV	
	(100 to 500) kHz	0.79 % of reading + 47 μV	Fluke 5500A Multi Product
	(33 to 330) mV		Calibrator
	(10 to 45) Hz	0.22 % of reading + 39 μV	
	45 Hz to 10 kHz	0.04 % of reading + 16 μV	
	(10 to 20) kHz	0.08 % of reading + 16 μV	
	(20 to 50) kHz	0.12 % of reading + 38 μV	
	(50 to 100) kHz	0.19 % of reading + 0.13 mV	
	(100 to 500) kHz	0.54 % of reading + 0.26 mV	





Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment	
	(0.33 to 3.3) V			
	(10 to 45) Hz	0.15 % of reading + 0.2 mV		
	45 Hz to 10 kHz	0.02 % o <mark>f re</mark> ading + 47 μV		
	(10 to 20) kHz	0.06% of reading + 47 μ V		
	(20 to 50) kHz	0.06% of reading + 47 μ V		
	(50 to 100) kHz	0.19 % of reading + 1.3 mV		
	(100 to 500) kHz	0.39 % of reading + 2.6 mV		
	(3.3 to 33) V			
	(10 to 45) Hz	0.12 % of reading + 2 mV		
	45 Hz to 10 kHz	0. <mark>03 % of re</mark> ading + 0.47 mV	Fluke 5500A Multi Product	
AC Voltage – Source	(10 to 20) kHz	0.062 % of reading + 2.0 mV	Calibrator	
	(20 to 50) kHz	0.15 % of reading + 4.0 mV	Canorator	
	(50 to 100) kHz	0.19 % of reading + 13 mV		
	(33 to 330) V			
	45 Hz to 1 kHz	0.04 % of reading + 5 mV		
	(1 to 10) kHz	0.06 % of reading + 12 mV		
	(10 to 20) kHz	0.07 % of reading + 26 mV		
	(330 to 1 020) V			
	45 Hz to 1 kHz	0.04 % of reading + 62 mV		
	(1 to 5) kHz	0.16 % of reading + 77 mV		
	(5 to 10) kHz	0.16 % of reading + 0.39 V		
	(10 to 100) mV			
	40 Hz to 1 kHz	$0.34 \text{ mV/V} + 1.1 \mu\text{V}$		
	(1 to 20) kHz	$0.41 \text{ mV/V} + 1.1 \mu\text{V}$		
	(20 to 50) kHz	$1.3 \text{ mV/V} + 1.1 \mu\text{V}$		
	(50 to 100) kHz	$5 \text{ mV/V} + 1.1 \mu\text{V}$		
	100 mV to 1 V			
AC Voltage – Measure	40 Hz to 1 kHz	90 μV/V + 20 μV		
	(1 to 20) kHz	$0.16 \text{ mV/V} + 20 \mu\text{V}$	HP 3458A w/ option 002	
	(20 to 50) kHz	$0.32 \text{ mV/V} + 20 \mu\text{V}$	Multimeter	
	(50 to 100) kHz	0.82 mV/V +29 μV		
	(1 to 10) V			
	40 Hz to 1 kHz	$85 \mu \text{V/V} + 0.2 \text{mV}$		
	(1 to 10) kHz	0.15 mV/V + 0.2 mV		
	(10 to 20) kHz	0.15 mV/V + 0.2 mV		
	(20 to 50) kHz	0.33 mV/V + 0.6 mV		
	(50 to 100) kHz	0.81 mV/V + 2.3 mV		





Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AC Voltage – Measure	(10 to 100) V 40 Hz to 1 kHz (1 to 10) kHz (10 to 20) kHz (100 to 700) V 40 Hz to 1 kHz (1 to 5) kHz (5 to 10) kHz	0.22 mV/V + 2 mV 0.23 mV/V + 2 mV 0.23 mV/V + 2 mV 0.41 mV/V + 20 mV 0.6 mV/V + 20 mV 0.61 mV/V + 66 mV	HP 3458A w/ option 002 Multimeter

Electrical – RF/Microwave

Parameter/Equipment	Range	_	ed Uncertainty of surement (+/-)	Reference Standard, Method, and/or Equipment	
	(-60 to +20) dBm 9 kHz to 2 GHz (2 to 4) GHz (4 to 8) GHz	W	0.28 dB 0.34 dB 0.3 dB	Agilent 4418B Power Meter w/E9304 H18 Power Sensor	
RF Power – Measure ²	(-35 to +20) dBm DC to 16 GHz (16 to 36) GHz DC to 50 GHz (50 to 65) GHz		0.35 dB 0.48 dB 0.45 dB + M 0.52 dB + M	R&S NRPZ57 Power Sensor	
Oscilloscopes ¹ Frequency Ref - Lo BW	10 MHz	0).25 µHz/Hz	HP 8648C w/option 1E5, R&S SMB100A w/option SMB-B1Signal Generators	
Oscilloscopes ¹ Frequency Ref – Hi BW	10 MHz		50 nHz/Hz	Anritsu Generator phase locked to Stanford Research Systems Rb Frequency Standard PRS10	
Oscilloscopes ^{1,2} Bandwidth	(-20 to +20) dBm 10 kHz to 2 GHz (2 to 4) GHz		0.28 dB 0.34 dB	HP 8648C w/option 1EA, R&S SMB100A Signal Generators	
	(-20 to +20) dBm 25 MHz to 8 GHz 25 MHz to 16 GHz 25 MHz to 36 GHz 25 MHz to 50 GHz 25 MHz to 65 GHz	C	0.3 dB 0.35 dB 0.48 dB + M 0.45 dB + M 0.52 dB + M	Anritsu MG369X Signal Generator	





Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Frequency – Measure	1 kHz to 300 MHz	0.6 nHz/Hz + 0.58 μHz	Stanford Research Systems - SR620 Counter, phase locked to Rb Frequency Standard PRS10
Frequency – Generate	10 MHz	0.001 6 nHz/Hz daily 0.6 nHz/Hz yearly	Stanford Research Systems Rb Frequency Standard - PRS10

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (*k*=2), corresponding to a confidence level of approximately 95%.

Notes

- 1. On-site calibration service is available for this parameter, 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.
- 2. M = mismatch error.
- 3. This scope is formatted as part of a single document including Certificate of Accreditation No. AC-2555.

Jason Stine, Vice President

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