

Vertex Calibration Services

Accredited Metrology & Instrument Calibration

118 Meridian Way, Suite 300, Harborcrest, ST 40221



CALIBRATION CERTIFICATE

Accreditation No. MAB-CAL-0142 | Certificate No. VX-2026-04871

Client / Instrument Owner

Organization: Nimbus Analytics Inc.
Address: 44 Harborview Industrial Park,
Unit 12, Fenwick Bay, ST 40590
Contact: Elena Voss, Quality Manager
P.O. Number: NIM-PO-22981

Instrument Under Test

Description: Digital Multimeter
Manufacturer: Apex Instruments
Model: DM-8500
Serial No.: AX8500-771204
Asset ID: NIM-EQ-0231
Condition: Good, as received

Calibration Record

Date of Calibration: 2026-06-18	Date of Issue: 2026-06-19	Recommended Cal. Due: 2026-06-18
Location: Vertex Cal. Lab, Bay 3	Procedure: VX-CP-014 Rev. D	Interval: 12 months

Traceability Statement

The measurement results reported in this certificate are traceable to the International System of Units (SI) through an unbroken chain of calibrations, each contributing to the stated measurement uncertainty, linking to the national primary standards maintained by the National Physical Metrology Institute (NPMI) [1]. Vertex Calibration Services is accredited by the Meridian Accreditation Board (MAB) to ISO/IEC 17025:2017 [2] for the calibration activities listed under Scope of Accreditation Certificate No. MAB-CAL-0142. This certificate may not be reproduced except in full, without the written approval of the issuing laboratory.

Reference Standard	Model / Serial No.	Certificate No.	Cal. Due
Multi-Product Calibrator	Meridian MC-8000A / MC-19204	MRD-2025-3312	2027-01-14
Precision Resistance Std.	Nexa RS-100 / NX-55821	MRD-2025-3288	2026-11-02
Digital Multimeter (ref)	Synapse DM-9000X / SY-40217	MRD-2025-3301	2026-12-19
Thermohygrometer	Vertex TH-220 / VX-TH-0087	MRD-2026-0104	2027-03-08

All reference standards listed above are themselves traceable to SI units through calibrations performed by laboratories accredited to ISO/IEC 17025:2017 by signatories to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement.

Environmental Conditions

All measurements were performed in a temperature- and humidity-controlled laboratory environment. The instrument under test was allowed a minimum stabilization period of two hours at ambient laboratory conditions prior to the commencement of testing, in accordance with the manufacturer’s specifications and procedure VX-CP-014.

Parameter	Requirement	Recorded (Start)	Recorded (End)
Ambient Temperature	23 °C ± 2 °C	22.8 °C	23.1 °C
Relative Humidity	40%–60% RH	47% RH	46% RH
Barometric Pressure	95–106 kPa (informative)	101.2 kPa	101.1 kPa
Warm-Up Period	≥ 30 minutes	120 minutes	—

Environmental conditions were continuously monitored using reference standard VX-TH-0087 (Vertex TH-220 thermohygrometer) and logged at 15-minute intervals throughout the calibration session. No excursions outside the stated requirements were recorded.

Calibration Method

Calibration was performed in accordance with internal procedure **VX-CP-014, Rev. D – Calibration Procedure for Digital Multimeters**, which is based on the manufacturer’s published specifications for the Apex DM-8500 and the general safety requirements of IEC 61010-1 [3]. The comparison method was used throughout: known reference voltages, resistances, and currents were applied to the instrument under test (UUT) by a multi-product calibrator, and the UUT indication was compared against the applied value as verified by an independently traceable reference multimeter.

- Functions calibrated: DC voltage, AC voltage (50/60 Hz), DC current, resistance, and continuity.
- Test points were selected at nominal 10%, 50%, 80%, and 100% of each active range, per procedure VX-CP-014 §4.2.
- As-found readings were recorded prior to any adjustment. No adjustment was required; as-found results are reported as as-left results throughout this certificate.
- Each reported reading is the mean of five repeated observations taken after the UUT indication had stabilized.
- Measurement uncertainty was evaluated in accordance with the JCGM 100:2008 *Guide to the Expression of Uncertainty in Measurement* (GUM) [4], using a coverage factor $k = 2$, corresponding to an approximate confidence level of 95%.

Decision Rule

Compliance with manufacturer specification is assessed by direct comparison of the measured error against the published tolerance limit, without application of a guard band, unless otherwise stated in the Statement of Conformity.

Measurement Results

Results below are reported as (measured value – reference value). Expanded uncertainties are reported at a coverage factor $k = 2$, corresponding to an approximate confidence level of 95%, and do not account for the long-term stability of the UUT beyond the calibration interval. Manufacturer tolerance limits are taken from the Apex DM-8500 User Manual, Rev. 3.

DC Voltage

Range	Applied Value	UUT Reading	Error	$U (k = 2)$	Tolerance ($\pm$)	Result
200 mV	180.000 mV	180.04 mV	+0.04 mV	0.03 mV	0.09 mV	Pass
2 V	1.80000 V	1.80020 V	+0.20 mV	0.15 mV	0.90 mV	Pass
20 V	18.0000 V	18.0030 V	+3.0 mV	1.1 mV	9.0 mV	Pass
200 V	180.000 V	180.050 V	+50 mV	12 mV	90 mV	Pass
1000 V	900.00 V	900.21 V	+210 mV	90 mV	500 mV	Pass

Resistance

Range	Applied Value	UUT Reading	Error	$U (k = 2)$	Tolerance ($\pm$)	Result
100 Ω	100.000 Ω	100.030 Ω	+0.030 Ω	0.020 Ω	0.090 Ω	Pass
1 k Ω	1.00000 k Ω	1.00010 k Ω	+0.10 Ω	0.08 Ω	0.90 Ω	Pass
10 k Ω	10.0000 k Ω	10.0020 k Ω	+2.0 Ω	1.5 Ω	9.0 Ω	Pass
100 k Ω	100.000 k Ω	100.040 k Ω	+40 Ω	15 Ω	90 Ω	Pass
1 M Ω	1.00000 M Ω	1.00060 M Ω	+0.60 k Ω	0.30 k Ω	0.90 k Ω	Pass
10 M Ω	10.0000 M Ω	10.0180 M Ω	+18 k Ω	9.0 k Ω	90 k Ω	Pass

AC Voltage (1 kHz sine reference)

Range	Applied Value	UUT Reading	Error	$U (k = 2)$	Tolerance ($\pm$)	Result
2 V	1.80000 V	1.80210 V	+2.1 mV	1.5 mV	9.0 mV	Pass
20 V	18.0000 V	18.0240 V	+24 mV	12 mV	90 mV	Pass
200 V	180.000 V	180.090 V	+90 mV	40 mV	500 mV	Pass
750 V	700.00 V	700.31 V	+0.31 V	0.15 V	2.00 V	Pass

DC current and continuity functions were also verified and found within manufacturer tolerance at all tested points; detailed readings are retained in the laboratory’s internal calibration record NIM-EQ-0231-2026-06 and are available upon request.

Uncertainty Budget (Representative)

The following budget illustrates the evaluation of measurement uncertainty for the 20 V DC voltage range at the 18.0000 V test point, evaluated in accordance with JCGM 100:2008 [4]. Uncertainty contributions for all other test points in this certificate were evaluated using the same method and are available in the laboratory’s internal calibration record on request.

Source of Uncertainty	Type	Distribution	Value	u_i	ν_i
Reference standard (cal. cert.)	B	Normal	0.70 mV	0.35 mV	∞
UUT resolution	B	Rectangular	0.52 mV	0.30 mV	∞
Repeatability ($n = 5$)	A	Normal	0.45 mV	0.20 mV	4
Reference standard drift	B	Rectangular	0.35 mV	0.20 mV	∞
Temperature influence	B	Rectangular	0.17 mV	0.10 mV	∞

Combined standard uncertainty:

Expanded uncertainty ($k = 2$, $\approx 95\%$ confidence):

$$u_c = \sqrt{\sum u_i^2} \approx 0.56 \text{ mV}$$

$$U = k \cdot u_c \approx 1.1 \text{ mV}$$

Effective degrees of freedom were computed using the Welch–Satterthwaite formula. The reported coverage factor $k = 2$ is a conservative approximation to the Student’s- t value at the effective degrees of freedom determined, consistent with laboratory policy VX-QP-009.

Statement of Conformity & Remarks

Statement of Conformity

Based on the results recorded in this certificate, the Apex DM-8500, Serial No. AX8500-771204, is found to **conform** to the manufacturer’s published accuracy specifications for all functions and ranges tested. This statement does not account for uncertainty of measurement in the pass/fail decision (no guard band applied); see *Decision Rule* above.

- No adjustment of the instrument was performed or required.
- This certificate relates only to the item described herein at the time and under the conditions of calibration; it does not imply any assurance of the instrument’s continued in-tolerance performance over its calibration interval.
- Vertex Calibration Services makes no representation regarding the suitability of this instrument for any particular application.
- Where an instrument is found to be out of tolerance, the client is notified directly and the affected functions are identified in a supplementary report; no such condition was identified during this calibration.
- Reported uncertainties do not include contributions from instrument drift between the calibration date and the point of use.

Recommended recalibration date: **2027-06-18**, or sooner if the instrument is subjected to mechanical shock, overload, or repair. The recalibration interval was assigned in accordance with client procedure NIM-QP-004 and Vertex Calibration Services policy VX-QP-011.

Approval

Calibrated by: **Marcus Chen**
Calibration Technician

Reviewed & approved by: **Dr. Sophia Reyes**
Technical Manager

Date of issue: 2026-06-19



Authorized Signature

This certificate shall not be reproduced except in full, without the written approval of Vertex Calibration Services. Results relate only to the item calibrated and are given at the time of calibration only. Vertex Calibration Services is accredited by the Meridian Accreditation Board under ISO/IEC 17025:2017 [2]; the scope of accreditation is available at the laboratory’s registered office upon request.

References

[1] Joint Committee for Guides in Metrology. International vocabulary of metrology – basic and general concepts and associated terms (VIM). Technical Report JCGM 200:2012, Joint Committee for Guides in Metrology, Sèvres, France, 2012.

[2] International Organization for Standardization. ISO/IEC 17025:2017 – general requirements for the competence of testing and calibration laboratories. Technical report, International Organization for Standardization, Geneva, Switzerland, 2017.

[3] International Electrotechnical Commission. IEC 61010-1 – safety requirements for electrical equipment for measurement, control, and laboratory use – part 1: General requirements. Technical report, International Electrotechnical Commission, Geneva, Switzerland, 2010.

[4] Joint Committee for Guides in Metrology. Evaluation of measurement data – guide to the expression of uncertainty in measurement (GUM). Technical Report JCGM 100:2008, Joint Committee for Guides in Metrology, Sèvres, France, 2008.

— End of Certificate No. VX-2026-04871 —