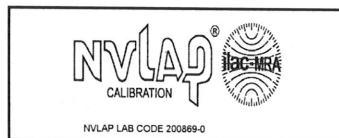


Pennsylvania Standards Laboratory  
2221 Forster Street  
Room G-44A  
Harrisburg, PA 17125

# REVISED Calibration Certificate

MASS ECHELON II



<b>Submitted By:</b>
Norman Brown
<b>Certificate For:</b>
Advanced Scale Inc. 13 Delta Drive Unit 6 Londonderry, NH 03053

<b>Certificate Number:</b> 211211R
<b>Certificate Date:</b> October 29, 2021
<b>Expiration Date:</b> October 31, 2022
<b>Purchase Order:</b> 9706

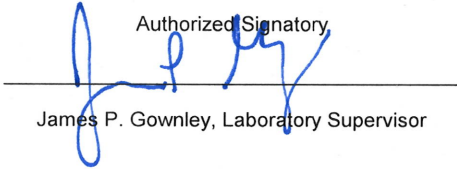
<b>Legal Requirements:</b>
In accordance with the Pennsylvania Code Title 70 Chapter 6 subsection 6.3 all field standards used for installing, servicing or repairing commercially used weighing and measuring devices within the Commonwealth of Pennsylvania shall be calibrated annually by the State Metrology Laboratory. These field standards shall be maintained and be adequate to test and place weighing and measuring devices into commercial service, and otherwise meet the requirements of NIST Handbook 44.
The Pennsylvania Standards Laboratory has reciprocity with all other State Metrology Laboratories provided they are currently recognized by NIST Office of Weights and Measures for the level of calibration provided.

In accordance with the Pennsylvania Code Title 3 Agriculture subsection 4110 b the specifications, tolerances, and regulations for commercial weighing and measuring devices as recommended by the National Institute of Standards and Technology Handbook 44 shall be the specifications, tolerances, and regulations for commercial weighing and measuring devices of the Commonwealth of Pennsylvania.
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Handbook 44 - Appendix A - Section 3.1. Adequacy. Recommendations regarding the specifications and tolerances for suitable field standards may be obtained from the Office of Weights and Measures of the National Institute of Standards and Technology. Standards will meet the specifications of the National Institute of Standards and Technology Handbook 105-Series standards (or other suitable and designated standards).
--

<b>Conformity Statement:</b>
This certifies that the weights designated within this certificate have been calibrated using the procedure(s) stated and at the time of calibration were found to have the mass corrections stated. When adjustments are made the adjusted mass correction values will be reported as an As Left value. The weights designated in this certificate have been evaluated for compliance to ASTM E617-18. The measurement result(s), taking into account the expanded uncertainty are within the associated maximum permissible error (MPE). The weights have not been evaluated for density or magnetism.

<b>Decision Rule:</b>
The absolute value of the mass correction plus the expanded uncertainty is less than or equal to the MPE. $  \text{Conventional Mass Correction}   + U \leq \text{MPE}$

This Calibration Certificate has been reviewed in accordance with the Pennsylvania Standards Laboratory Quality Management System.	
<p>Authorized Signatory</p>  James P. Gownley, Laboratory Supervisor	Date: October 29, 2021

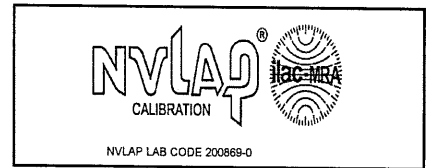
This certificate must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government.

This Certificate may not be reproduced except in its entirety.

Pennsylvania Standards Laboratory  
 2221 Forster Street  
 Room G-44A  
 Harrisburg, PA 17125

# REVISED Calibration Certificate

MASS ECHELON II



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Norman Brown
<b>Certificate For:</b>
Advanced Scale Inc. 13 Delta Drive Unit 6 Londonderry, NH 03053

<b>Certificate Number:</b> 211211R
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**Traceability Statement:**

The Pennsylvania Standards Laboratory is recognized as a Mass Echelon II Laboratory by NVLAP and NIST Office of Weights and Measures. The mass standards of the Commonwealth of Pennsylvania were used in the calibration of the designated weights. These standards are traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported. The certificate number above shall be used in referencing metrological traceability for weights identified only in this calibration certificate. The actual standards and equipment used during the calibration of the weights designated in this certificate are identified within the certificate as Equipment Used. The Pennsylvania Standards Laboratory holds a current Certificate of Metrological Traceability issued by the National Institute of Standards and Technology for the Scope of weights calibrated within this certificate.

**Uncertainty Statement:**

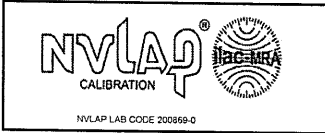
The expanded uncertainty ( $U$ ) has been calculated under the guidance of the BIPM JCGM 100:2008 Evaluation of measurement data - Guide to the expression of uncertainty in measurement (GUM 1995 with minor corrections) with additional guidance from NIST IR6969 SOP 29 (2019) Standard Operating Procedure for the Assignment of Uncertainty and the calibration procedure referenced in this certificate. The standard uncertainties of Type A and Type B components have been combined using the root-sum-of-the-squares (RSS) method. This combined standard uncertainty is multiplied by a coverage factor ( $k$ ), identified within the calibration certificate, to determine the expanded uncertainty with a confidence level of approximately 95 %. A detailed list of the Type A and Type B components included in the calculation of the expanded uncertainty is available upon request.

**Conversion Factors:**

The SI unit for mass (m) is the kilogram (kg).			
The conversion factors below should be used to convert reported units within this certificate into SI units.			
Pound (lb)	Multiply the (lb) value by 0.453 592 37	Gram (g)	Multiply the (g) value by 0.001
Ounce (oz)	Multiply the (oz) value by 0.028 349 523 125	Milligram (mg)	Multiply the (mg) value by 0.000 001

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# REVISED Calibration Certificate

MASS ECHELON II

**Environmental Conditions During Calibration**

Temperature (°C) : 20.59 to 21.61  
 Humidity (%) : 45.13 to 49.35  
 Pressure (mmHg) : 738.37 to 739.13

**Certificate Number: 211211R**

Received Date: October 20, 2021  
 Calibration Date: October 26, 2021  
 Certificate Date: October 29, 2021  
 Expiration Date: October 31, 2022

**Procedure Used:** NIST SOP 5 (May 2019) Recommended Standard Operating Procedure for Using a 3-1 Weighing Design

Equipment Used	Serial Number	Calibration Date	Due Date	Report Number
Comparator KA30-3P	2180552	August 5, 2021	August 5, 2022	Cert. on File
5611T Thermistor Probe (KA30-3P)	B4B2502	February 5, 2021	February 5, 2023	01180779D
Comparator XPR10003SC	C121841589	August 4, 2021	August 4, 2022	Cert. on File
5611 Thermistor Probe (PR10003)	0404-175	February 5, 2021	February 5, 2023	01180779C
2564 Thermistor Scanner Module	8C126	February 5, 2021	February 5, 2023	01180779A,B,C,D
Transmitter, Vaisala PTU200	Y0550002	May 17, 2021	May 17, 2023	17-D3D4A-20-1
Temp/Humidity Probe, Vaisala	Y0610002	May 17, 2021	May 17, 2023	17-D3D4A-20-1
30 kg to 2 kg weight set, SS	PA0009989	November 18, 2020	November 18, 2030	OBS 21-0589 / OBS 21-0614
1kg to 1g weight set, SS	PA0009990	November 16, 2020	November 16, 2030	OBS 21-0588
500 mg weight, SS	1QWY	June 30, 2020	June 30, 2022	OR-20-162-C

Manufacturer	Customer ID	Serial Number	PA Number	Class	Condition
Rice Lake	N/A	See Below	N/A	ASTM 4	Good

Serial Number	Mass	Construction Type	Base Material	Assumed Density (g/cm <sup>3</sup> )	Mass Values		Mass Corrections		MPE* (kg)	± U (kg)	Coverage Factor (k)
					True Mass (kg)	Conventional Mass (kg)	True Mass (kg)	Conventional Mass (kg)			
5IEM	20 kg	Two-Piece	Stainless Steel	7.84	20.0000855	20.0000242	0.0000855	0.0000242	0.000400	0.0000091	2.01
5IEF	10 kg	Two-Piece	Stainless Steel	7.84	10.0000568	10.0000262	0.0000568	0.0000262	0.000200	0.0000030	2.02

\*Maximum Permissible Error

NOTE: This certificate was revised to correct the serial numbers for the two (2) weights above.

The PSL will use assumed densities provided by the customer for conducting calibrations. When the customer does not provide the assumed densities the PSL will use densities obtained from the weight manufacturer or from previous calibration certificates.

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density." The conventions are: artifact reference density 8.0 g/cm<sup>3</sup>; reference temperature 20 °C; normal air density 0.0012 g/cm<sup>3</sup>. Conventional mass was formally called "Apparent Mass versus 8.0 g/cm<sup>3</sup>" in the United States. (See OIML D28 (2004)). The conventional mass values should be used for routine measurements made in air.

True Mass: Mass in a Vacuum, Typically these values should be used during the calibration of standards using the appropriate densities and air buoyancy corrections to determine mass values.

Echelon II Mass	Total Calibrated	Total Adjusted	Total Not Adjusted
	2	0	2

Metrologist(s) that performed the calibration: Chris Drupp

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