

### Appendix 10.7

### **Calibration Certificates**

**Coolglass Wind Farm EIAR Volume 3** 

**Coolglass Wind Farm Limited** 

SLR Project No.: 501.V00727.00006

26 June 2023







Certificate Number: UCRT21/2224

Page

pproved Signatory

B. Giles



0653

### Date of Issue: 05 October 2021

Calibrated at & Certificate issued by: **ANV Measurement Systems Beaufort Court** 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

SLR Consulting Limited 2nd and 3rd Floors 15 Middle Pavement

Nottingham NG1 7DX

Order No. 422-17278

Customer

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator Description

Identification Manufacturer Instrument Serial No. / Version Type 00710361 Rion Sound Level Meter NL-52 Rion Firmware 2.0 10903 Rion Pre Amplifier NH-25 Rion UC-59 19635 Microphone Rion

Calibrator NC-75 34713324 Calibrator adaptor type if applicable NC-75-022

Performance Class

TP 10. SLM 61672-3:2013 Test Procedure

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 05 October 2021 ANV Job No. UKAS21/10653

05 October 2021 Date Calibrated

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of patternevaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Certificate No. Previous Certificate Dated Laboratory

Initial Calibration

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# CERTIFICATE OF CALIBRATION UCRT21/2224 UKAS Accredited Calibration Laboratory No. 0653 Certificate Number UCRT21/2224 Page 2 of 2 Pages

Sound Level Meter Inst					vels ind	icated.	
SLM instruction manual tit	ie NL-52/NL-42	Description for IEC	61672-1	<u> </u>			
SLM instruction manual re		No. 56034 21-0	)3 S	ource	Rion		
Date provided or internet		19 March 202					
	Case Corrections	Wind Shield Corre	ctions	Mic Pr	essure to	Free Field C	orrections
Uncertainties provided	Yes	Yes				Yes	
Total expanded uncertain			2-1:2013	YE	S		
Specified or equivalent Ca		Specified					
Customer or Lab Calibrate		Customers Calibi	ator				
Calibrator adaptor type if a Calibrator cal. date	applicable	NC-75-022 05 October 202	04				
Calibrator cert. number		UCRT21/221					
AND STATE STATE SHIPPEN AND STATE ST	ov. Lob	0653	,				
Calibrator cal cert issued	ру цар		-ID 6		-		
Calibrator SPL @ STP		93.95				ce sound pre	ssure level
Calibrator frequency		1000.00		alibratio	n check f	requency	
Reference level range	4 16 1 11	Single	dB		101:11	10.45	
Accessories used or corre					d Shield		
Note - The Extension Cab		-600M -60		UNION 1 1992	alibration		
Environmental conditions		Start		End	_		7
	Temperature	23.00		2.90	±	0.30 °C	_
	Humidity	38.5		37.6	±	3.00 %RH	-
T. E. E. 10 6 11 E.	Ambient Pressure	99.25	9	9.33	±	0.03 kPa	<del></del>
Indication at the Calibratic		4				V2.11.70.700.00	
Initial indicated level			sted indi		/el	94.0	dB
Uncertainty of calibrator u	sed for Indication at	the Calibration Che	ck Frequ	ency ±		0.10	dB
Self Generated Noise	1 71 4-	7.0 LID A.M.					
Microphone installed -		7.6 dB A Weig				1	
Microphone replaced with			Under Ra	ange indi		<del></del>	
Weighting	A LID LUD	C	LUD	00.0	Z	Turn	
Section Control Contro	1.4 dB UR		UR	20.8	dB	UR	
Self Generated Noise rep	orted for information	only and not used to	o assess	contorm	nance to a	a requiremen	
The reported expanded un	ncertainty is based o	n a standard uncert	ainty mul	tiplied by	/ a cover	age factor k=	2 providing
a coverage probability of a				The second second		_	The same of the sa
UKAS requirements.	approximately 30%.	The uncertainty eva	liuationi	ias been	carned	out iii accorda	IIICE WILLI
to exchange of the	<b>-</b> r n n:						
Additional Comments	The results on this	certificate only relate	to the it	ems cali	brated as	s identified ab	ove.
KI							
None							
		END					
		END					
Calibrated by: C. Hi		END					R



3







Certificate Number: UCRT21/2223

Date of Issue: 05 October 2021 Calibrated at & Certificate issued by: ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

	Page	1	of	2	Pages	
Approved S	ignatory			,		
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			12		7	
			• 1	-/		
B. Giles				•		

Customer SLR Consulting Limited

2nd and 3rd Floors 15 Middle Pavement

Nottingham NG17DX

Order No. 422-17278

Sound Level Meter / Pre-amp / Microphone / Associated Calibrator Description

Identification Manufacturer Instrument Type Serial No. / Version Rion Sound Level Meter NL-52 00710359 Rion Firmware 2.0 Rion Pre Amplifier NH-25 10901 Rion Microphone UC-59 19633 NC-75 34713324 Rion Calibrator

Calibrator adaptor type if applicable NC-75-022

Performance Class

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 05 October 2021 ANV Job No. UKAS21/10653

05 October 2021 Date Calibrated

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of patternevaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

**Previous Certificate** Dated Certificate No. Laboratory Initial Calibration

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Weighting

dB

CERTIFICATE OF CALIBRATION

#### UKAS Accredited Calibration Laboratory No. 0653 Pages Sound Level Meter Instruction manual and data used to adjust the sound levels indicated. SLM instruction manual title NL-52/NL-42 Description for IEC 61672-1 SLM instruction manual ref / issue No. 56034 21-03 Source Rion 19 March 2021 Date provided or internet download date Case Corrections Wind Shield Corrections Mic Pressure to Free Field Corrections Uncertainties provided Yes Yes Yes Total expanded uncertainties within the requirements of IEC 61672-1:2013 YES Specified or equivalent Calibrator Specified Customer or Lab Calibrator **Customers Calibrator** Calibrator adaptor type if applicable NC-75-022 Calibrator cal. date 05 October 2021 Calibrator cert. number UCRT21/2215 Calibrator cal cert issued by Lab 0653 Calibrator SPL @ STP 93.95 dB Calibration reference sound pressure level Calibrator frequency 1000.00 Hz Calibration check frequency Single Reference level range dB Accessories used or corrected for during calibration Extension Cable & Wind Shield WS-15 Note - The Extension Cable was used between the SLM and the pre-amp for this calibration. Environmental conditions during tests Start End Temperature 23.40 23.20 0.30 °C 39.4 38.3 3.00 %RH Humidity 99.21 Ambient Pressure 99.24 0.03 kPa Indication at the Calibration Check Frequency Adjusted indicated level Initial indicated level 94.0 dΒ 94.0 dB 0.10 Uncertainty of calibrator used for Indication at the Calibration Check Frequency ± dP Self Generated Noise Microphone installed -Less Than 17.0 A Weighting ldB. Microphone replaced with electrical input device UR = Under Range indicated

Certificate Number UCRT21/2223

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

15.6

Self Generated Noise reported for information only and not used to assess conformance to a requirement

dB









Certificate Number: UCRT21/2222

Date of Issue: 05 October 2021 Calibrated at & Certificate issued by: **ANV Measurement Systems Beaufort Court** 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk

Page	1	of	2	Pages	
Approved Signatory					
B. Giles		BL	Ŋ		

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems SLR Consulting Limited Customer

2nd and 3rd Floors 15 Middle Pavement Nottingham

NG1 7DX

422-17278 Order No.

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

> Manufacturer Instrument Type Serial No. / Version 00710358 NL-52 Rion Sound Level Meter Rion Firmware 2.0 NH-25 Rion Pre Amplifier 10900 Rion Microphone UC-59 19632 Rion Calibrator NC-75 34713324 NC-75-022 Calibrator adaptor type if applicable

Performance Class

Identification

TP 10. SLM 61672-3:2013 Test Procedure

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 05 October 2021 ANV Job No. UKAS21/10653

Date Calibrated 05 October 2021

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of patternevaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

**Previous Certificate** Certificate No. Dated Laboratory

Initial Calibration

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CERTIFICATE OF CALIBRATION	Certificate Number UCRT21/2222					
UKAS Accredited Calibration Laboratory No. 0653	Page	2	of	2	Pages	

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SLM instruction ma			42 De	scription for IE							
				No. 56034 2		Source	Rion				
Date provided or in				19 March 20							
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Total expanded und Specified or equiva			quireme			13 YES	_				
Customer or Lab C		.OI		Specified Customers Cal							
Calibrator adaptor t		ahlo	C	NC-75-02							
Calibrator cal. date	уре п аррпс	abie		05 October 2							
Calibrator cert. num	her			UCRT21/22							
Calibrator cal cert is		h		0653	. 10						
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Calibrator frequenc				1000.00	Hz					uie iev	CI
Reference level rar	50			Single	dB	Calibration of	песк п	equenc	у		
Accessories used of		for during c	alibratio		0.27	able & Wind	Shield \	MS-15			
Note - The Extension											
Environmental cond				Start	T	End	I	U			
Environmental con		perature	-	22.80	-	23.20	±	0.30 °			
	Hum			40.4	+	39.5	±	3.00			
		ient Pressu	re	98.89	+	99.22	±	0.03 H			
Indication at the Ca				00.00	-	OO.LL		0.00 1	u u		
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Self Generated Noi		,a.		34.12.4.13.1.3.		9440.10) =		00			
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Microphone replaced with electrical input device - UR = Under Range indicated											
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Microphone replace Weighting	ed with elect 11.5	rical input d A dB UF	levice -	UR C 14.6 dB	= Under UR	20.3	Z dB	100000000000000000000000000000000000000	ement		
Microphone replace Weighting	ed with elect 11.5	rical input d A dB UF	levice -	UR C 14.6 dB	= Under UR	20.3	Z dB	100000000000000000000000000000000000000	ement		
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Microphone replace Weighting	ed with elect 11.5	rical input d A dB UF	levice -	UR C 14.6 dB	= Under UR	20.3	Z dB	100000000000000000000000000000000000000	ement		
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Microphone replace Weighting Self Generated Noi  The reported expar a coverage probabi UKAS requirements	ad with elect	rical input of A  A  GB  GB  GB  GB  GB  GB  GB  GB  GB	ed on a %. The	UR C 14.6 dB y and not used standard unce	UR I to asse	20.3 ss conformar nultiplied by a	Z dB nce to a covera arried o	age factout in acc	or k=2, cordand	e with	
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Microphone replace Weighting Self Generated Noi  The reported expar a coverage probabi UKAS requirements Additional Commer	ad with elect  11.5 se reported  added uncertal lity of appro	rical input of A  A  JdB  UF  for informati  informati  state of the s	ed on a %. The	Standard unce	UR I to asse	20.3 ss conformar nultiplied by a n has been ca	Z dB nce to a covera arried o	age factout in account	or k=2, cordand	e with	
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Certificate Number: UCRT21/2220

Page

Approved Signatory

B. Giles



0653

Pages

### Date of Issue: 05 October 2021

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

SLR Consulting Limited 2nd and 3rd Floors 15 Middle Pavement Nottingham

Nottinghan NG1 7DX

422-17278

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification Manufacturer Instrument Type Serial No. / Version NL-52 00710362 Rion Sound Level Meter Rion Firmware 2.0 NH-25 Rion Pre Amplifier 10904 Rion Microphone UC-59 19636 Rion Calibrator NC-75 34713324 NC-75-022 Calibrator adaptor type if applicable

Performance Class

Customer

Order No.

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the

applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 05 October 2021 ANV Job No. UKAS21/10653

Date Calibrated 05 October 2021

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate Dated Certificate No. Laboratory

Initial Calibration

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SLM instruction manual title

SLM instruction manual ref / issue

Date provided or internet download date

# CERTIFICATE OF CALIBRATION UCRT21/2220 UKAS Accredited Calibration Laboratory No. 0653 Page 2 of 2 Pages Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

No. 56034 21-03

19 March 2021

Source

Mic Pressure to Free Field Corrections

NL-52/NL-42 Description for IEC 61672-1

Case Corrections | Wind Shield Corrections

Uncertainties provided	Yes	Yes			Yes	;			
Total expanded uncertain	ties within the requir	ements of IEC 6167	72-1:20	13 YES					
Specified or equivalent Calibrator Specified									
Customer or Lab Calibrator Customers Calibrator									
Calibrator adaptor type if applicable NC-75-022									
Calibrator cal. date 05 October 2021									
Calibrator cert. number		UCRT21/221	5						
Calibrator cal cert issued	by Lab	0653							
Calibrator SPL @ STP		93.95	dB	Calibration re	eference so	und pressure le	vel		
Calibrator frequency		1000.00	Hz	Calibration c	heck freque	ncy			
Reference level range		Single	dB						
Accessories used or corre				able & Wind S		5			
Note - The Extension Cal	ole was used betwee	n the SLM and the	pre-am	p for this calib	oration.				
Environmental conditions	during tests	Start		End					
	Temperature	23.30		23.60	± 0.30				
	Humidity	40.3		38.7	± 3.00	%RH			
9	Ambient Pressure	99.02		99.11	± 0.03	3 kPa			
Indication at the Calibration	on Check Frequency								
Initial indicated leve	93.9	dB Adi	usted in	idicated level	94.0	) dB			
Uncertainty of calibrator u					0.10				
Self Generated Noise									
Microphone installed -	Less Than 17	7.1 dB A Weig	hting						
Microphone replaced with	electrical input devi			Range indica	ted				
Weighting	Α	Ċ			7				
	2.2 dB UR	16.2 dB	UR	23.4	dB <b>I</b> UR	┪			
Self Generated Noise rep					V-10-10	<b>⊸</b> iirement			
		,							
The reported expanded u									
a coverage probability of	approximately 95%.	The uncertainty ev	aluatior	n has been ca	arried out in	accordance wit	h		
UKAS requirements.									
Additional Comments	The results on this	certificate only relat	e to the	items calibra	ated as ident	ified above.			
None									
		END					• • •		
Calibrated by: B. Bo	ogdan						R 2		





MTS Calibration Ltd, The Grange Business Centre, Belasis Avenue, Billingham TS23 1LG, England Telephone: 01642 876 410

### CERTIFICATE OF CALIBRATION

Page 1 of 11 pages

Approved Signatory:

Issued by:

MTS Calibration Ltd

RA Shem.

Date of Issue:

12 August 2022

Certificate Number: 37295

Tony Sherris

### Sound Level Meter

### Sound Level Meter Periodic Tests to EN 61672-3: 2013 Class 1

Client:

**Environmental Measurements** Unit 12, Tallaght Business Centre Whitestown Business Park Co.Dublin 24, Ireland

Instrument Make:

Larson Davis

Instrument Model: Serial Number:

LxT1L 0004479

Associated Equipment Preamplifier Microphone Calibrator Calibrator supplied by

Make PCB PCB Britel & Kizer

Model PRMLxT1L 377B02 4231

Serial number 042636 339594 3014620

MTS for this calibration The measurements were performed at The Grange Business Centre, Belasis Avenue, TS23 1LD. The results only apply to the items tested.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013 Class 1

#### Test results summary, detailed results are shown on subsequent pages.

Tests performed	Section	Results of test	Page	Comments
Calibration Certificate	22		1	
Additional Information			2	
Indication with Calibrator Supplied	10	No Limit	3	
Self-Generated Noise	11	No Limit	3	
Frequency and Time-weightings at 1kHz	14	Complies	3	
Long term stability	15	Complies	3	
High stability	21	Complies	3	
Acoustic Tests	12	Complies	4	
Frequency Weighting A	13	Complies	5	
Frequency Weighting C	13	Complies	6	
Frequency Weighting Z	13	Complies	7	
Level Linearity	16	Complies	8	
Level Linearity Range Control	17		n/a	SLM only has one range
Tone-burst Response	18	Complies	9	
Peak C sound level	19	Complies	10	
Overload indication	20	Complies	11	

The instrument required a replacement microphone in order to meet the above specifications.

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3: 2013 for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2: 2013, to demonstrate that the model of sound level meter fully conformed to the Class 1 specifications in IEC 61672-1: 2013, the sound level meter submitted for testing conforms to the Class 1 specifications of IEC 61672-1: 2013

Additional tests performed Microphone full frequency response

Filter calibration, third octave or octave

Reference 37310 37295F

See additional certificate See additional certificate

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory



### Calibration Certificate

Certificate Number 2021012148

Customer:

Environmental Measurement Unit 12 Tallaght Business Centre Whitestown Business Park Dublin, 24, Ireland

 Model Number
 LxT SE
 Procedure Number
 D0001.8378

 Serial Number
 0006600
 Technician
 Ron Harris

 Test Results
 Pass
 Calibration Date
 28 Sep 2021

Initial Condition As Manufactured Calibration Due

 Temperature
 23.76 °C ± 0.25 °C

 Description
 Sound Expert LxT
 Humidity
 50.2 %RH ± 2.0 %RH

Class 1 Sound Level Meter Static Pressure 85.46 kPa ± 0.13 kPa

Firmware Revision: 2.404

Evaluation Method Tested electrically using Larson Davis PRMLxT1L S/N 070099 and a 12.0 pF capacitor to

simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone

sensitivity of 23.6 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with

Calibration Certificate from procedure D0001.8384:

 IEC 60651:2001 Type 1
 ANSI S1.4-2014 Class 1

 IEC 60804:2000 Type 1
 ANSI S1.4 (R2006) Type 1

 IEC 61252:2002
 ANSI S1.25 (R2007)

 IEC 61672:2013 Class 1
 ANSI S1.43 (R2007) Type 1

 IEC 61260:2001 Class 1
 ANSI S1.11 (R2009) Class 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017. Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev O Supporting Firmware Version 4.0.5, 2019-09-10

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

LARSON DAVIS - A PCB PIEZOTRONICS DIV. 1681 West 820 North Provo, UT 84601, United States 716-684-0001





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