Appendix 11.3: Calibration certificates of noise instruments used

MTS Calibration Ltd, The Grange Business Centre, Belasis Avenue, Billingham TS23 1LG, England Telephone: 01624 876 410								
CERTIFICA	TE O	F CALIBR	ATIO	N	Page 1 c	of 11 pages		
					Approved Signa	atory:		
Issued by: MTS Ca	,24) herm						
Date of Issue: 25 January	Date of Issue: 25 January 2019 Certificate Number: 32812					Tony Sherris		
		Sound Leve	l Mete	ər				
Sound Level	Meter	Periodic Te	sts to	EN 61	672-3: 2013	Class 1		
Client: Environmental Measuren Unit 12, Tallaght Busines Whitestown Business Pa Co.Dublin 24, Ireland	s Centre	half of Brendan O'Reilly	Instrumen Instrumen Serial Nun	t Model:	Larson Davis LxT1L 0004570			
8		Associated Equipment Preamplifier Microphone Calibrator Calibrator supplied by	Lars	Vake PCB PCB son Davis r this calibration	Model PRMLxT1L 377802 CAL200	Serial number 036058 152974 9175		
and the state of the		ry, detailed resu				Avenue construction		
Periodic tests w	ere perfoi	rmed in accordance	with proc	edures fron	n IEC 61672-3:2013	Class 1		
Tests performed	Section	Results of test	Page	Comments	i i			
Calibration Certificate Additional information	22		1					
Indication with Calibrator Supplied	10	No Limit	3					
Self-Generated Noise	11	No Limit	3					
Frequency and Time-weightings at 1kHz Long term stability	14 15	Complies 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	Complian	n/a	Only one rang	je			
Tone-burst Response Peak C sound level	18 19	Complies Complies	9 10					
Overload indication	20	Complies	11					
Additional tests performed								
Microphone		32814			See additional certifica			
Filter, third octave or octave 32812F See additional certificate The instrument was within the above specification as received - no modifications were made 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								
		ance with the laboratory a		Construction of Construction o	and the answer of the processing of the strength of the second seco			
	ratory or oth	f measurement to the SI s ner recognised national me I, except with the prior writ	etrology inst	tutes. This ce	rtificate may not be repro			

		MTS Calib	oration L	td,	τ	
MT		The Grange B				
			Avenue,			
		Billingham	n TS23 11	LG,		
O - Ill A!		Enc	land			
Calibrati	nn.	Telephone: (6 410		
			1024 07	0410		
					r	
CERTIFICAT	re o	F CALIBR	ATIO	Ν	Page 1 of	11 pages
ULINI IU/						
					Approved Signat	tory:
Issued by: MTS Ca	librati	on I td				
	IIMIGUN				121 5	han
Date of Issue: 24 January	2019	Certificate Number:	32818			Tony Sherris
	1	Sound Leve	Moto		1	
Cound Loual I					C70 0. 0040	
Sound Level	vieter	Periodic Te	SIS IO	EN 61	672-3: 2013	Class 1
Client: Environmental Measurem	ents on be	half of Brendan O'Reilly	Instrumen	t Make:	Larson Davis	
Unit 12, Tallaght Business	Centre		Instrumen	t Model:	LxT1L	
Whitestown Business Par	k		Serial Nun	nher [.]	0004643	
	n		Jena nun	ilber.	0004043	
Co.Dublin 24, Ireland						
		Associated Equipment		Make	Model	Serial number
10		Preamplifier		PCB	PRMLxT1L	042742
10		Microphone		PCB	377B02	173111
371		Calibrator	Lars	on Davis	CAL200	9175
		Calibrator supplied by	by MTS fo	r this calibration		
Test results	summa	ry, detailed resu	ilts are	shown o	n subsequent pa	ages.
					IEC 61672-3:2013 C	TANLA IN THE COMPANY
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	Only one rang	e	
Tone-burst Response	18	Complies	9			
Peak C sound level	19	Complies	10			
Overload indication	20	Complies	11			
Additional tests performed						
Microphone		32820			See additional certificate	
Filter, third octave or octave		32818F			See additional certificate	1
Th	e instrument	was within the above specific	ation as rece	ived - no modific	ations were made	
The sound level meter submitted for testing	has succes	sfully completed the periodic	tests of IEC (61672-3: 2013 fo	the environmental condition	s under which the tests were
performed. As evidence was publicly ava						
accordance with IEC 61672-2: 2013, to der						
r	neter submit	ted for testing conforms to th	e Class 1 spe	cifications of IE	C 61672-1: 2013	
This certificate is issued	d in accorda	ance with the laboratory a	ccreditation	requirements (of the United Kingdom Acc	reditation
					nits of measurement realis	
					tificate may not be reprodu	
	than in full	, except with the prior writ	ten approva	l of the issuing	laboratory.	

MT Calibrati		Billinghan	usiness Avenue n TS23 1 gland	Centre, , LG,		
CERTIFICA	TE C	OF CALIBR	ATIO	Ν	Page 1 c	of 11 pages
					Approved Signa	atory:
Issued by: MTS Ca	ılibrati	on Ltd			,24	Shin
Date of Issue: 25 January	2019	Certificate Number:	32815			Tony Sherris
		Sound Leve	l Mete	er		
Sound Level	Meter	Periodic Te	sts to	EN 61	672-3: 2013	Class 1
Client: Environmental Measuren Unit 12, Tallaght Busines: Whitestown Business Pau Co.Dublin 24, Ireland	s Centre	half of Brendan O'Reilly	Instrumen Instrumen Serial Nun	t Model:	Larson Davis LxT1L 0004647	
9		Associated Equipment Preamplifier Microphone Calibrator Calibrator supplied by	Lars	Make PCB PCB ion Davis r this calibration	Model PRMLxT1L 377B02 CAL200	Serial number 042725 171552 9175
	0.00	ry, detailed resu		**	the second se	
Periodic tests we	re perfor	med in accordance v	with proce	edures from	IEC 61672-3:2013	Class 1
Tests performed	Section	Results of test	Page	Comments		
Calibration Certificate Additional information	22		1			
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 High stability	15 21	Complies Complies	3			
Acoustic Tests	12	Complies	3			
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 Tone-burst Response	17	Complice	n/a	Only one range		
Peak C sound level	18 19	Complies Complies	9 10			
Overload indication	20	Complies	11			
Microphone		32817			See additional certificate	
Filter, third octave or octave		32815F			See additional certificate	1
The sound level meter submitted for testing performed. As evidence was publicly ava accordance with IEC 61672-2: 2013, to dem m This certificate is issued Service. It provides tra	has success ilable, from a constrate that neter submitte l in accordanceability of	n independent testing organi	tests of IEC 6 sation respon ter fully confo class 1 spec creditation r rstem of unit	1672-3: 2013 for isible for approvi ormed to the Class iffications of IEC equirements of s and/or to uni	the environmental condition ng the results of pattern eva ss 1 specifications in IEC 61 61672-1: 2013 f the United Kingdom Acco ts of measurement realis	Iluation tests performed in 672-1: 2013, the sound level creditation ed at the
-	than in full,	except with the prior writte	en approval	of the issuing I	aboratory.	

Calibration Certificate

Certificate Number 2019012216 Customer: Environmental Measurement Unit 12 Dublin, 24, Ireland

Model Number Serial Number Test Results	Serial Number 0005990		Procedure Number Technician Calibration Date	D0001.8384 Ron Harris 1 Oct 2019		
Initial Condition Description		ufactured Expert LxT	Calibration Due Temperature Humidity	23.6 49.6	°C %RH	± 0.25 °C ± 2.0 %RH
	Class 1	Sound Level Meter are Revision: 2.402	Static Pressure	85.93	kPa	± 0.13 kPa
Evaluation Metho	od	Tested with: Larson Davis PRMLxT1L. S/N 055804 PCB 377B02. S/N 316349 Larson Davis CAL200. S/N 9079 Larson Davis CAL291. S/N 0108	Dat	a report	ed in di	B re 20 μPa.
Compliance Stan	dards	Compliant to Manufacturer Specification Calibration Certificate from procedure D IEC 60651:2001 Type 1 IEC 60804:2000 Type 1 IEC 61252:2002 IEC 61260:2001 Class 1 IEC 61672:2013 Class 1	•	1 as 1	n comb	ined with

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 17025:2005.

Test points marked with a ‡ in the uncertainfies column do not fail 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 J Supporting Firmware Version 2.301, 2015-04-30

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2019-10-1711:46:42



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Calibration Certificate

Certificate Number 2019012218 Customer: Environmental Measurement Unit 12 Dublin, 24, Ireland

Model Number Serial Number Test Results	LxT SE 0005992 Pass		Procedure Number Technician Calibration Date	D0001.8384 Ron Harris 1 Oct 2019		
Initial Condition	As Man	ufactured	Calibration Due Temperature	23.64	°C	± 0.25 °C
Description	Class 1	Expert LxT Sound Level Meter are Revision: 2.402	Humidity Static Pressure	49.5	%RH kPa	
Evaluation Metho	od	Tested with: Larson Davis PRMLxT1L. S/N 055806 PCB 377B02. S/N 316352 Larson Davis CAL200. S/N 9079 Larson Davis CAL291. S/N 0108	Dat	a report	ed in d	B re 20 μPa.
Compliance Stan	ndards	Compliant to Manufacturer Specification Calibration Certificate from procedure D IEC 60651:2001 Type 1 IEC 60804:2000 Type 1 IEC 61252:2002 IEC 61260:2001 Class 1 IEC 61672:2013 Class 1		1 is 1	n comb	ined with

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 17025:2005.

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 J Supporting Firmware Version 2.301, 2015-04-30

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2019-10-1712-03:55

Calibration Certificate

Certificate Number 2020009385

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

Model Number	CAL200 18140 Pass		Procedure Number	D0001.8386			
Serial Number			Technician	Scott Montgomery			
Test Results			Calibration Date 26 Aug 2020				
LINE IN A Marchael		u factured	Calibration Due				
Initial Condition	ndition As Manufactured		Temperature	23	°C	± 0.3 °C	
Description	Larson	Davis CAL200 Acoustic Calibrator	Humidity	35	%RH	± 3 %RH	
			Static Pressure	101.2	kPa	±1kPa	
Evaluation Metho	d	The data is aquired by the insert volta circuit sensitivity. Data reported in dB	•	he refere	nce mic	crophone's open	
Compliance Stan	dards	Compliant to Manufacturer Specificat IEC 60942:2017	ions per D0001.8190 and the ANSI S1.40-2006	following	standa	ards:	

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 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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Standards Used							
Description	Cal Date	Cal Due	Cal Standard				
Agilent 34401A DMM	08/04/2020	08/04/2021	001021				
Larson Davis Model 2900 Real Time Analyzer	04/02/2020	04/02/2021	001051				
Microphone Calibration System	03/03/2020	03/03/2021	005446				
1/2" Preamplifier	09/17/2019	09/17/2020	006506				
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/06/2020	08/06/2021	006507				
1/2 inch Microphone - RI - 200V	12/06/2019	12/06/2020	006511				
Pressure Transducer	10/18/2019	10/18/2020	007204				

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