NOISE & VIBRATION INDUSTRIAL HYGIENE SOLUTIONS

NOISE DOSIMETERS, HUMAN VIBRATION METERS, AND SOUND LEVEL METERS

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INDUSTRIAL NOISE ASSESSMENT

Industrial Hygienists and safety professional responsible for protecting workers from dangerous levels of noise in the workplace often need to map sound levels in key parts of an industrial environment or throughout an entire plant. Sound maps – (often called sound surveys, noise surveys, or occupational noise surveys) – give health and safety professionals important information to begin the process of reducing worker noise exposure.

Task-based or job-based noise measurements are another component of industrial acoustics – the noise to which a worker is exposed in a given task is measured, and then a formula is used to calculate the overall noise exposure for the workday. An accurate, easy-to-use, IEC and ANSI compliant sound level meter is key to compiling useful sound level information. Octave bands provide information that can help identify noise source and select appropriate hearing protection.

SPARTAN™ SOUND LEVEL METER
SERIES 821

Spartan Sound Level Meter is an ideal tool for workplace noise exposure assessment and plant noise surveys. Fully compliant with IEC and ANSI standards for Class 1 or Class 2 sound level meters, Spartan supports ISO 9612:2009 measurement strategies for task or job-based measurements. Included software offers data visualization and streamlined results reporting.

- Large, responsive touch display

- Long battery life – up to 40 hours

- Built-in dosimetry tools

- Automatic data download via Bluetooth or USB options

- Flexible powering options, including wireless charging

- Optional 1/1 and 1/3 octave band analysis available

- Ready to measure in seconds with quick boot time

- Included software offers data anaylsis and reporting

PERSONAL NOISE EXPOSURE

Industrial Hygienists, EHS Consultants, and Safety Managers know that complying with noise exposure limits protects workers from permanent noise-induced hearing loss. Understanding actual noise levels experienced by individuals in the workplace is key to complying with guidelines established by OSHA, ISO, and other global directives. One way to determine whether an individual's noise exposure is within acceptable limits is to measure personal noise exposure with a noise dosimeter that meets IEC and ANSI noise dosimetry standards and provides exposure levels in an easy-to-understand format. Knowledge of a worker's daily noise exposure is critical information in mitigation of worker hearing loss risk, deployment of hearing conservation programs and engineering noise controls.

SPARTAN™ NOISE DOSIMETER
MODEL 730

With Spartan, control test setup, timers, and measurements for up to four virtual dosimeters on a single device wirelessly via the easy-to-read display and on-device navigation. For greater efficiency, perform these tasks wirelessly via low-energy Bluetooth from a PC or via the exclusive mobile app, LD Atlas™. Spartan facilitates faster, simpler, consistent operation designed to save time and money.

With LD Atlas, all essential tasks, including viewing real-time exposure data, exceedances, battery life, and measurement metrics, can be completed directly from your iOS® or Android® device. Monitor devices free from the worry of interfering with the work routine of the person being measured. Generate reports, including the full data file, from the mobile interface before sharing via email. Spartan Noise Dosimeters are configured with built-in wireless charging pads in a robust travel case and available in 1-, 3-, 5-, and 10-packs.

- Full control and live monitoring via LD Atlas app
- Programmable (on/off) LED alarm for exceedances or actions
- Built-in bump detection and motion detection
- Voice-to-text notations with LD Atlas app
- Optional Event Sound Recording (730-ESR)
- Optional 1/1 Octave Band filters (730-OB1)
- Optional Bluetooth disabling (730-NBT)

SPARTAN™ INTRINSICALLY SAFE NOISE DOSIMETER
MODEL 730IS

- All of the benefits of Spartan in an intrinsically safe design
- ATEX, UL 913, IECEx, FCC, CAN/CSA C22.2, MSHA approved

SPARTAN-IS SAFETY RATINGS/MARKINGS:

ATEX/IECEx
II 1G Ex ia IIC T165 ºC Ga   ITS20ATEX205538X
I 1M Ex ia I Ma   -10 ºC ≤ TAMB ≤ +50 ºC
IECEx ETL 19.0045X

CAN/USA
Class I, Zone 0, AEx ia IIC   Groups A, B, C & D,
T165 ºC Ga   T165 ºC
Class I, Division 1,   -10 ºC ≤ TAMB ≤ +50 ºC

APPROVAL NO. 18-A210001-0

PERSONAL VIBRATION EXPOSURE

Excessive exposure to vibration, whether through the whole body or confined to the hand and arm, has wide-ranging, harmful effects. For Industrial Hygienists, measuring a worker's exposure to vibration is key to avoiding vibration-related injury and illness. If measured vibration values are higher than action values specified in national and international standards, workers may be at a significant risk of injury. Low back and neck pain, vestibular issues, and hand-arm vibration syndrome are all serious consequences of human body vibration exposure. Human vibration measurement tools with built-in metrics linked to standards assist safety professionals in understanding risk and making smart decisions about exposure risks and actions or deployment of administrative or engineering controls.

HUMAN VIBRATION METER
MODEL HVM200

The HVM200 is a small, rugged human vibration meter with built-in Wi-Fi, designed to measure hand-arm, whole body, and general vibration. It includes the metrics and frequency weightings needed to measure human vibration. This three-channel meter meets the requirements of ISO 8041:2005 and measures per ISO 2631-1, -2, & -5 and ISO 5349 in support of the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), Vibration at Work Regulations 2005, and the directive 2002/44/EC. This makes the HVM200 an ideal choice to demonstrate compliance with human vibration requirements and regulations worldwide.

- Designed for hand-arm, whole body, and general vibration measurements
- Control and view data from LD Atlas mobile app
- Meets ISO criteria and EU directives
- Ergonomically designed mounting adaptors and application optimized ICP® accelerometers
- USB 2.0 and Wi-Fi
- Removable Micro SD Memory Card
- Replaceable Lithium Battery

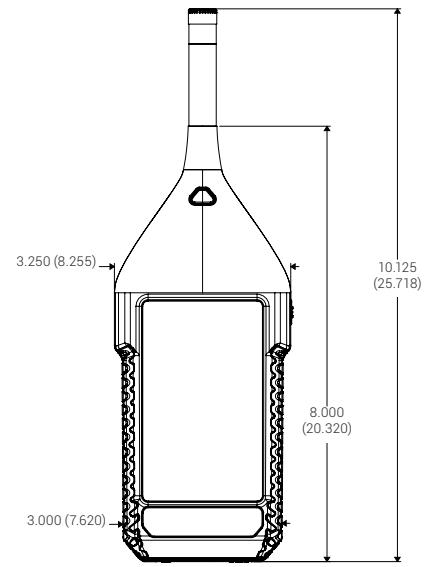## LD ATLAS™ MOBILE APP
FOR SPARTAN & HVM200

Install LD Atlas on your phone or tablet – available for both iOS and Android – and connect to your Spartan Sound Level Meter Series 821, Spartan Noise Dosimeter Series 730 and Human Vibration Meter Model HVM200. Use LD Atlas to easily check on the status of your meter, make setup changes for a new measurement, analyze data, listen to recorded audio files, and even create and share PDF reports.

SPECIFICATIONS

SPARTAN™ SOUND LEVEL METER

SPECIFICATIONS				
Model	721 IH	721 IH-D	821 IH	821 IH-D
Class	2	2	1	1
Time History Logging	✔	✔	✔	✔
Measurement History	✔	✔	✔	✔
Dosimetry	✔	✔	✔	✔
OBA (1/1 and 1/3 Bands)	-	✔	-	✔
Dynamic Range (A-weighted typical)	16 to 140 dB			
Time Weightings	Fast, Slow & Impulse			
Frequency Weightings	A, C & Z			
Data Storage (µSDHC card)	8 GB standard Up to 256 GB			
Communication	USB-C, Bluetooth BLE 4.1			
Display	480 x 800 color with capacitive touch			
Power	Internal Lithium battery, USB-C or external 12 V			
Battery Recharge	Qi Wireless, USB-C, or external 12 V			
Runtime (internal battery @ 22 C)	40 hours (display off) 15 hours (display on)			
External Power	6 V to 24 V DC (600 mW w/display off)			
Logging	Time history: 1 s to 1 h Measurement History: 1 min to 6 h			
Metrics	Leq, Lmax, Lmin, Lpeak, Ln (6 values), Time above			
1/1 and 1/3 Octave Metrics (Optional)	Leq, Lmax, Lmin			
Signal Output	AC/DC on 3.5 mm TRS jack			
Preamplifier	Removable PRM821			
Operating Temperature	-30 to 60 °C			
Dimensions (H x W x D)	10.1 x 3.3 x 1.3 inches 260 x 83 x 32 mm			
Weight	12.1 oz (383 g)			
Filters (Optional)				
Bandwidth	1/1 and 1/3 Octaves			
Frequencies (base 10)	1/1: 8 Hz to 16 kHz 1/3: 6.3 Hz to 20 kHz			
Standards Compliance	ANSI S1.11-2014 Class 1 IEC 61260:2014 Class 1			
Standards				
Acoustic	ANSI S1.4-2014 Class 1 IEC 61672-1:2013 Class 1			
Noise Dosimetry	ANSI S1.25-1991 IEC 61252:2017			
Safety	Directive 2014/35/EU IEC 61010-1:2010 RoHS Directive 2011/65/EU			
Approvals	CE, RoHS, WEEE			

3.250 (8.255)
10.125 (25.718)
8.000 (20.320)
3.000 (7.620)

Outline Drawing - Front
Dimensions in inches (centimeters).

µSDHC Memory Card
¼"-20 Thread Hole
12 V Power
USB-C
3.5 mm TRS

Meter Ports

SPARTAN NOISE DOSIMETER MODEL 730 AND INTRINSICALLY SAFE MODEL 730IS

SPECIFICATIONS

Performance

Standards	ANSI S1.25-1991 (R2017), IEC 61252 Ed. 1.2
Linear Operating Range	52 – 140 dB rms A-weighted
Dynamic Range	94 dB
Peak Range	78 – 143 dB Peak, C-weighted
Peak Weightings	A, C, Z
RMS Weightings	A, C, Z
Time Weightings	Slow, Fast, Impulse
Frequency Range	20 Hz to 10 kHz
Data Logging	Selectable 1 second or 1 minute samples
Logged data	L_{Aeq}, L_{Ceq}, L_{Cpeak}, L_{Zpeak}, L_{ASmax}, L_{AFmax}, TWA3, TWA5, Motion
Memory	730: 32 GB internal; 730IS: 2 GB internal
Communications	Bluetooth Low Energy 4.1 USB 2.0 (Micro-B connector)
Battery	730: Rechargeable Lithium Ion; 730IS: Rechargeable NiMH
Run Time	730: 40 hours typical; 730IS: 30 hours typical
Charge Time	730: 3 hours from full discharge; 730IS: 12 hours from full discharge
Charger	Qi-compliant wireless or USB
Compliance	CE, ROHS, WEEE
Motion	Overall motion percentage and bump
Languages	English, Spanish, Italian, French, Portuguese, German

Virtual Dosimeter

Virtual Dosimeters	4 independent with configurable LED indication
Exchange Rate	3, 4, 5, 6
Criterion Level	70.0 to 100.0 dB
Threshold	70.0 to 100.0 dB
Shift Time	1 to 24 hours
Alarms	2 independent with configurable indication
Measurement Results	Dose; ProjDose; L_{AVG}; TWA(8); Proj TWA(8); Lex,8h; Lep,d; Proj Lep,d

Summary Measured Values (Common to all virtual dosimeters)

$L_{\omega T}$ (SPL), $L_{\omega eq}$ (Leq), $L_{\omega pk}$ (Lpeak), $L_{\omega TMax}$ (Lmax), $L_{\omega TMin}$ (Lmin) where
  ω = A, C, or Z frequency weighting
  T = F, S, or I time weighting
Lpeak, Lmax, & Lmin including time of occurrence
L_{C-A}, Exposure (Pa²s & Pa²h), Motion
Exceedance count and time for 2 rms and 3 peak thresholds
Overload count, duration, and percentage

Mechanical

Display	Color LCD 176 x 176 pixels, always on with low light sensor and front light
Keys	Four buttons
Weight (including clips and windscreen)	730: 112 g (4.2 oz.); 730IS: 130 g (4.6 oz.)
Dimensions	85 x 54 x 39 mm (3.35 x 2.13 x 1.54 in.) dosimeter only

SPECIFICATIONS (CONTINUED)

Microphone	¼-inch Model 375A03
Operating Temperature	-10 to +50 °C (14 to 122 °F)
Operating Humidity	Up to 90% RH, non-condensing

1/1 Octave Filters (optional)

Standards	ANSI/ASA S1.11-2014; IEC 61260-1:2014 Class 1
Filters	31.5 Hz to 8 kHz
Linear Operating Range	42 to 140 dB @ 1 kHz
Measured Results	L_{Zeq} (Leq), L_{ZTMax} (Lmax), L_{ZTMin} (Lmin)

Event Audio Recording (optional)

Format	16-bit .wav
Sample Rate	8 kHz
Recording Time	Fixed: 2 s pre-trigger and 10 s post-trigger
Trigger Source	L_{AS}, L_{AF}, L_{CS}, L_{CF}, $L_{Aeq,1s}$, $L_{Ceq,1s}$
Trigger Level	40 – 140 dB, selectable

ORDERING INFORMATION

730	Spartan 730 noise dosimeter with one windscreen and two clips. Includes calibration certificate				
730IS	Spartan 730IS intrinsically safe noise dosimeter with one windscreen and two clips. Includes calibration certificate				
730-PKxx-EU* 730-PKxx-UK* 730-PKxx-US*	Complete Spartan 730 noise dosimeter kit that includes quantity 'xx' dosimeters and one USB to Bluetooth dongle. Each dosimeter includes one windscreen, two clips, and a calibration certificate.**				
	'xx'	Spartan 730 Dosimeters	Calibrator (qty 1)	Calibration Adapter	Case
	01	1	CAL150	1 x ADP109	CCS056
	03	3	CAL150	2 x ADP109	CCS057
	05	5	CAL150	2 x ADP109	CCS058
	10	10	CAL150	2 x ADP109	CCS059
	- EU includes a Type C power plug for use in Europe - UK includes a Type G power plug for use in the UK - US includes a Type A power plug for use in North America				
730-ESR	Option to add event sound recording				
730-OB1	Option to add 1/1 octave filters				
730-NBT	Option to disable Bluetooth				

Accessories

CAL150	Class 2 calibrator, with user-selectable output 94 or 114 dB at 1 kHz, ½ in. opening with ¼ in. adaptor (ADP109) and calibration certificate included
WS012-XX	Replacement windscreen for Spartan 730. Available in 1, 3, 5, 10, or 25 packs where XX is the number of windscreens
730-CLIPS	Replacement clip, quantity 2
CER-730	ISO 17025 factory calibration and certification of Spartan
CER-730-OBA	Calibration of 1/1 octave filters
ADP109	Calibrator adaptor for ½ in. to ¼ in. opening. Used with Spartan
DVX016	USB to Bluetooth dongle used with Spartan

*730IS intrinsically safe version is available for these models (replace "730" with "730IS")
**Versions without CAL150 calibrator available

HUMAN VIBRATION METER MODEL HVM200

GENERAL SPECIFICATIONS

Input

Input	ICP®, IEPE or CCP
Excitation Current	2 mA
Input Connector	¼-28 4-pin male
Input Linear Range	
Fc weighting	0.2 mV to 5.0 V at 80 Hz
Wh weighting	0.9 mV to 5.0 V at 16 Hz
Bandwidth	0.4 Hz to 3000 Hz
Range	Single range
Calibration	TEDS or manual entry
Sample Rate	7161.458 Hz

Measured Values

Measurement Modes	Hand-arm, Whole-body, Vibration
Metrics by mode	
Vibration	RMS, Peak, Min, Max (x, y, z, & Σ)
Hand-arm	RMS, Peak, Min, MTVV, A(1), A(2), A(4), A(8) (x, y, z &Σ)
Whole-body	RMS, Peak, Min, MTVV, A(8), A(8)Exp, EP, VDV (x, y, z & Σ)
Frequency Weightings	
Vibration	Fa (0.4 Hz to 100 Hz), Fb (0.4 Hz to 1250 Hz), Fc (6.3 Hz to 1250 Hz)
Hand-arm	Wh
Whole-body	Wb, Wc, Wd, We, Wf, Wj, Wk, Wm
Measurement Units	m/s^2, cm/s^2, ft/s^2, in/s^2, g, dB

Time History (Logging)

Store Interval	1, 2, 5, 10, 20, 30 s; 1, 2, 5, 10, 20, 30 min; 1hr
Stored Values	RMS and peak for x, y, z & Σ

1/1 and 1/3 Octave Filters (Optional)

1/1 Octave Filters	0.5 Hz to 2000 Hz
1/3 Octave Filters	0.4 Hz to 2500 Hz
Weighting	Unweighted
Measured Values	RMS, Max
Compliance	IEC 61260-1:2014 Class 1
	ANSI S1.11-2014 Part 1, Class 1

Power Supply

Internal Battery	Rechargeable Li-ion, user replaceable
External power	USB (PSA035)
Charge Time	3.5 hours using PSA035
Run Time	12 hours (Connect to Wi-Fi) 9 hours (Access Point)
Communication	USB-B, Wi-Fi 802.11 b/g

Physical

Dimensions (H x W x D)	4.6 x 2.6 x 0.7 inches 118 x 67 x 18 mm
Weight (including battery)	4.6 oz. (130 gm)

Environmental

Operating Temperature	14 ºF to 122 ºF (-10 ºC to 50 ºC)
Operating Humidity	0 to 90% relative humidity, non-condensing

GENERAL SPECIFICATIONS (CONTINUED)

Included Accessories

PSA035	100 – 240 VAC to 5V USB power supply with adapters
BAT018	Internal rechargeable lithium battery

Compliance

ISO 8041:2005 Human response to vibration - Measuring instrumentation
IEC 61010-1 (2010) Safety
IEC 61326-1:2013 EMC
IEC 61325-2-3:2013 EMC safety
ISO 2631-1:1997 Whole-body vibration – General requirements
ISO 2631-2:2003 Whole-body vibration –Vibration in buildings
ISO 2631-4:2001 Whole-body vibration – Rotational motion
ISO 2631-5:2004 Whole-body vibration –Vibration containing shocks
ISO 5349-1:2001 Hand-transmitted vibration – General requirements
ISO 5349-2:2001 Hand-transmitted vibration – Practical guidance
EN 1032:2003 Mechanical vibration - Testing of mobile machinery
ANSI S2.70

ORDERING INFORMATION

HVM200	3-channel vibration meter for general and human vibration. Includes CBL217-01. Sensors not included
HVM200-HA-40F	Kit for hand-arm vibration includes HVM200, CCs047, CCS048-L, ADP081A, SEN040F & SWW-G4-HVM
HVM200-WB	Kit for whole body vibration includes HVM200, CCS047, SEN027 & SWW-G4-HVM
HVM200-ALL-40F	Kit for hand-arm and whole body vibration includes HVM200, CCS047, CCS048-L, ADP081A, SEN040F, SEN027 & SWW-G4-HVM
HVM200-0B3	Option for 1/1 and 1/3 octave filters. Includes SWW-G4-HVM
HVM200-RAW	Option to record sampled waveforms for all three channels
SWW-G4-SDK	Software Development Kit

Optional Accessories

CBL216	¼-28 4-pin to 4-pin mini connector for SEN026
CBL217	¼-28 4-pin to ¼-28 4-pin, 5 ft. (1.5 m) cable
SEN020	Triaxial accelerometer, 0.1 mV/(m/s^2), 10-32 fem thread
SEN026	Triaxial accelerometer, 1 mV/(m/s^2), for ADP063
SEN027	Seat pad with triaxial accelerometer, 10 mV/(m/s^2)
SEN040F	Triaxial accelerometer, 0.1 mV/(m/s^2), for ADP080A, 81A and 82A
SEN041F	Triaxial accelerometer, 1 mV/(m/s^2), for ADP080A, 81A and 82A
ADP063	Palm adapter for use with SEN026
ADP080A	"T" adapter for use with SEN040F or SEN041F
ADP081A	Handle adapter for use with SEN040F or SEN041F
ADP082A	Circle clamp adapter for use with SEN040F or SEN041F
ADP084A	Kit including ADP080A, ADP081A, ADP082A and ADP063
CCS047	Hard shell case for HVM200 and accessories
CCS048-S	Small arm band for HVM200, fits arm circumference of 8 to 12.5 in. (20 to 32 cm)
CCS048-L	Large arm band for HVM200, fits arm circumference of 10.5 to 16.5 in. (27 to 42 cm)
394C06	Hand-held shaker, 9.81 m/s^2 at 159.2 Hz
CER-HVM200	Factory calibration of HVM200, does not include sensor

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