VBR-HS-LR-2, software version 1.0

Vibrometer HS



The Vibrometer HS (*High Shock*) is a triaxial wireless device designed to monitor strong vibrations through particle velocity. It supports waveform transmission for event analysis and streams data to the MyMove platform for visualization and alarms.

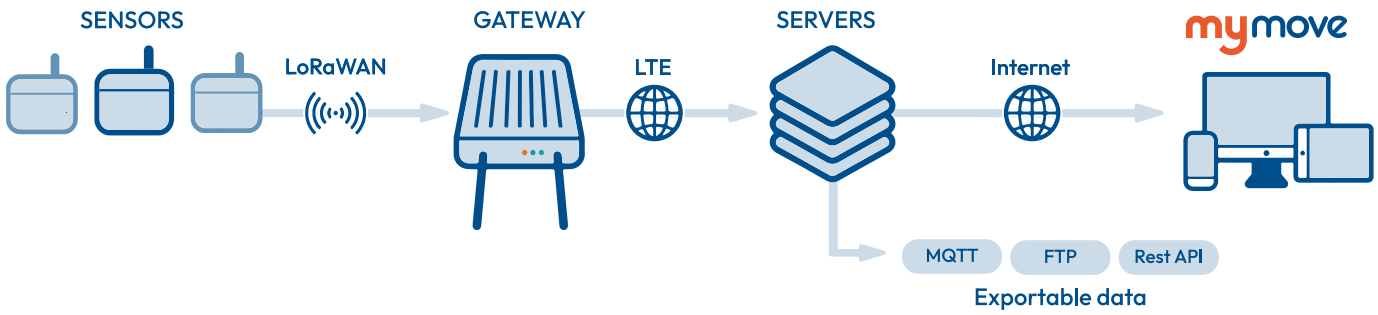
Its design ensures quick and easy installation, significantly reducing time and costs.

KEY FEATURES

- For indoor and outdoor operation
- External Battery Pack *(SBE-STD-CB-1, sold separately)* required
- Wireless LoRaWAN connection
- Fully remote configuration and management
- Quick, flexible, and easy installation
- Structural vibration assessment and human exposure monitoring
- Trigger-based data acquisition with programmable threshold
- Data logging in the internal memory
- Data management and processing through the MyMove platform

The sensor is optimized for a long battery life, which can be further extended by adjusting the sensor configuration.

To operate, the sensor requires a Move Solutions Gateway installed nearby.



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Output data

The sensor provides information about vibrational activity at the installation point with the following output parameters.

PEAK AND SUMMARY METRICS

- **PPV** : peak particle velocity
- **PVS** : peak vector sum
- **PPA** : peak particle acceleration
- **RMS velocity**
- **RMS acceleration**

FREQUENCY AND SPECTRAL ANALYSIS

- **F_{mg}** : zero-crossing frequency
- **FFT** : Fast Fourier Transform
- **F_{dom}** : dominant frequency on the FFT spectrum
- **Waveforms for each axis**

HUMAN EXPOSURE INDICATORS

- **KB_{FTi}** : maximum of $KB_F(t)$ over each 30-second interval
- **KB_{FTm}** : mean value of KB_{FT} over the measurement period
- **KB_{Fmax}** : maximum value of KB_{FT}
- **$KB_{FTr(rest)}$** : assessment vibration value over the Day/Night window, with rest periods weighted as prescribed by DIN 4150-2
- **$KB_{FTr(no\ rest)}$** : same, without rest-period weighting
- **VDV_i** : instantaneous Vibration Dose Value, measured over a period of 30 seconds
- **VDV** : overall Vibration Dose Value

The sensor also records the temperature at measurement time.

NOTE

Due to sensor configuration constraints, not all of the output parameters listed above can be provided simultaneously; the set of output parameters depends on the selected sensor setup.

Working principle

The sensor can be configured for structural vibration assessment and human exposure monitoring, working with one of the supported regulations listed in the **Measurement performances** table.

A custom regulation is also available to tailor the data processing to more specific needs.

NOTE

Some regulations require a specific working mode and/or specific settings. In this case some parameters might be forced to specific values.

The customer can choose the preferred acquisition type from the following list of **Operating modes**:

1 TRIGGER MODE

The sensor will constantly measure velocity on the 3 axes. A buffer equal to the pre-trigger time is always held by the sensor. When the threshold is surpassed on at least one of the axes:

- With **auto-stop** end condition, the sensor will stop recording when the signal is below the trigger level on all 3 axes for the specified number of samples. As a consequence, different events have a different number of samples.
- With **fixed post-trigger** end condition, the sensor will stop recording after a specified post-trigger number of samples. All the events recorded have the same number of samples.

The sensor provides both summary parameters and the full waveform.

2 CADENCE MODE

The sensor measures velocity on the 3 axes. Time is divided into intervals that are equal to the cadence selected.

Over the cadence time, the device detects a series of key parameters for the selected processing mode. The full waveforms are not provided, but only some summary parameters.

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3 COMBO MODE (TRIGGER MODE + CADENCE MODE)

A combination of Trigger and Cadence modes.

Technical specifications

MEASUREMENT PERFORMANCES	
Sensing technology	MEMS accelerometer
Number of axes	3
Sampling frequency range[1]	250 Hz – 2 kHz
Bandwidth lower limit range	0.5 Hz – 10 Hz
Bandwidth upper limit range[2]	80 Hz – 315 Hz
Velocity full scale range	up to ±500 mm/s (±19.685 in/s)
Velocity resolution	0.0153 mm/s (0.000602 in/s) or better (16 bits)
RMS velocity noise[3]	≤ 0.15 mm/s (0.00591 in/s)
Acceleration full scale range	up to ±40.96 *g*
Supported regulations[4,5]	UNI 9916, Circulaire '86, ISEE[6], OSMRE[6], DIN 4150-2, RI 8507, BS 6472-1, BS 7385-2, SN 640-312a, DIN 4150-3 315Hz, DIN 4150-3 80Hz, custom (user-defined configuration)
Operating modes	Cadence, Trigger, Combo[7]

[1] Downsampled from a main sampling frequency of 4 kHz.

[2] Available options depend on selected sampling frequency.

[3] Typical value measured on a reference sample with 40.96 *g* acceleration full scale, 2 kHz sampling frequency and 1–315 Hz bandwidth.

[4] The device implements data processing according to the regulations listed (filtering, frequency weighting and evaluation parameters). Unless stated otherwise in a calibration certificate supplied with the unit, it is not certified as compliant with the instrument performance requirements of these regulations. Verifying that the measurement setup meets the applicable standard or regulation is the responsibility of the user. Contact Move Solutions for more details.

[5] When a specific regulation is selected many sensor settings are forced to the required value. To access the full set of configuration parameters please select the "custom" regulation (user-defined configuration).

[6] The device measures ground and structural vibration only. Air overpressure (airblast) is not measured.

[7] When Combo mode is selected, multiple operating modes are enabled simultaneously; as a result, individual mode performance may be reduced. To achieve optimal performance for each operating mode, it is recommended to avoid using Combo mode.

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MEASUREMENT PERFORMANCES

Processing modes, operating modes and output parameters	**Processing mode**	**Operating mode**	**Output parameters**
	A	Cadence	PPV, PVS, F_{mg}, RMS velocity, PPA, timestamp, temperature[1]
		Trigger	PPV, PVS, F_{mg}, RMS velocity, PPA, waveforms, FFT, F_{dom}, timestamp, temperature[1]
	B	Cadence[2]	KB_{FTi} (over 30-second slots), KB_{FTm}, KB_{Fmax}, $KB_{FTr(rest)}$, $KB_{FTr(no\ rest)}$, RMS acceleration, timestamp, temperature[1]
	C	Cadence[2]	VDV_i (over 30-second slots), VDV, RMS acceleration, timestamp, temperature[1]
Cadence range[3]	30 seconds – 24 hours		
Activation threshold range[4]	1.5 mm/s or 0.0591 in/s – Velocity full scale		
Data buffer maximum depth[4]	**Samples**	**Sampling frequency**	**Duration**
	21844 samples	250 Hz	87.3 seconds
		500 Hz	43.6 seconds
		1000 Hz	21.8 seconds
		2000 Hz	10.9 seconds
Trigger mode features[4]	Velocity activation threshold for each axis		
	Selectable pre-trigger time		
	Selectable post-trigger time, or auto-recording with selectable auto-stop time		
	Waveform data acquisition with individual enable flag for each axis		
Typical waveform transmission time[4,5]	**Number of samples**	**Transmission time**	
	250	10 seconds	
	1000	45 seconds	
	10000	7.5 minutes	
	21844 (max)	16 minutes	
Timestamp accuracy[6]	±1 s		
Temperature resolution	0.05 °C		
Temperature accuracy[1]	±0.2 °C		
Internal storage memory[7]	≥ 400 events with waveform, circular		

[1] Temperature is measured internally within the sensor and may differ from the ambient temperature.

[2] Cadence period not customizable in B and C processing modes.

[3] Applies to Cadence mode only.

[4] Applies to Trigger mode only.

[5] The estimation refers to a sensor in a typical working environment with good quality radio connection between the sensor and the Gateway. It also refers to an input signal (velocity) whose value does not exceed 25% of full scale. All 3 axes are enabled. Transmission time is measured from when the full waveform has been recorded until the last packet is sent to the MyMove platform.

[6] Under good LoRaWAN radio coverage.

[7] The actual memory capacity depends on sensor configuration and input signal characteristics.

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GENERAL DATA	
Wireless connection technology	Sub-GHz LoRaWAN protocol[1] (Gateway required)
Supported LoRaWAN regions	EU868, US915, AU915, AS923-1/2/3/4, IN865, KR920
Wireless coverage[2]	1 km line of sight from the nearest Gateway
Cable connection	Move Solutions 8-pole connector (**Move Link**)
IP rating[3]	IP67
Power supply	External Move Solutions **Battery Pack** (SBE-STD-CB-1) required (sold separately)
Operating temperature range	From -40 °C to +85 °C
Dimensions[4]	129 × 100 × 98 mm
Weight[4]	0.6 kg
Package weight	1 kg
Case material	GD-AlSi12 alloy
Installation options[5]	Wall, floor, or ceiling mount. Four-point attachment using screw anchors (Ø6 mm max). One set included in the package
Software version	v1

[1] LoRaWAN packets are transmitted on a best-effort basis, and delivery is not guaranteed. Packet loss is inherent to the technology and depends on conditions outside the sensor, such as radio coverage, gateway density, interference and the installation site.

[2] Wireless coverage may vary based on the actual deployment scenario.

[3] The declared IP rating is guaranteed only when the product is correctly assembled, with the lid properly screwed in place, the antenna installed, and the Move Link connector protected either by a properly connected external cable or by the supplied protective cap when no cable is present.

[4] Refers to the sensor unit with protective dome, antenna, and fixed plate. The mounting plate and other additional accessories are not considered. For an illustrated overview of these components, refer to the product manual.

[5] To ensure the best measurement performance, please follow the best practices for the installation of vibration measurement equipment and/or the requirements of regulations of interest.

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BATTERY LIFE

Mode[1,2]	Sampling frequency		
	500 Hz	1000 Hz	2000 Hz
Cadence mode *Cadence set to 2 minutes*	3.1 years	2.1 years	1.2 years
Trigger mode[3] *Waveform on all axes, 1 event per hour*	2.2 years	1.6 years	0.9 years
Trigger mode[3] *Waveform on all axes, 4 events per hour*	1.6 years	1.2 years	0.8 years
Trigger mode[3] *No waveform, 4 events per hour*	3.0 years	1.8 years	1.0 years

[1] Configuration parameters that are not specified are to be considered in their default configuration.

[2] The proposed battery life is an estimation for a sensor powered by Move Solutions **Battery Pack** (SBE-STD-CB-1) in a typical working environment with good quality of the radio connection between the sensor and the Gateway. Actual battery life may be worse in case the product is used under extreme conditions, such as prolonged working in high or low temperatures, bad quality of radio connection between the sensor and the Gateway, etc.

[3] Trigger mode values refer to a typical case. Battery life depends strongly on the vibrations at the installation site (number and duration of events) and on the sensor configuration, and may differ significantly from the stated values.

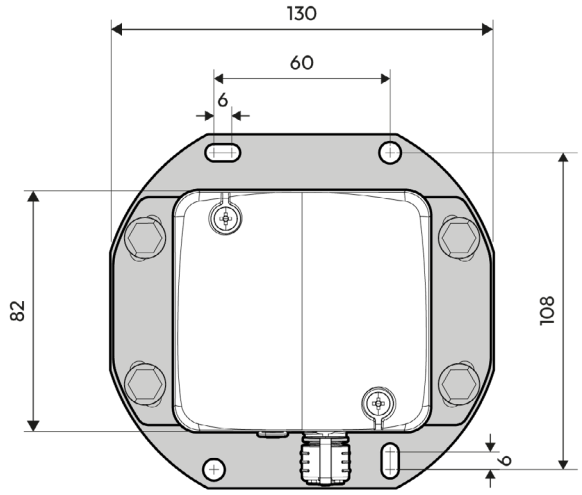
ORDERING INFORMATION

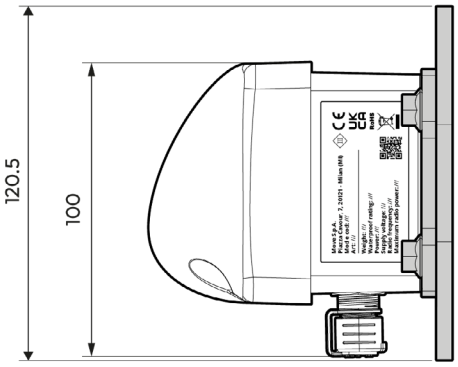
SENSOR	PART NUMBER
Vibrometer HS sensor *Includes: sensor unit, antenna, protective dome, mounting plate*	VBR-HS-LR-2
ACCESSORIES	**PART NUMBER**
Battery Pack	SBE-STD-CB-1
Data download cable	SCM-STD-CU-1

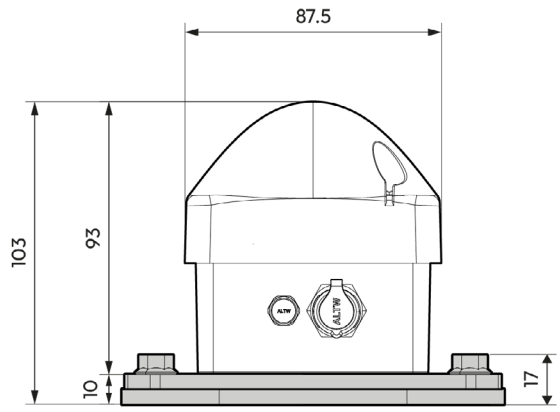
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Mechanical drawings

All dimensions are in millimeters







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For complete information regarding proper use of the device, safety precautions, installation, operation, and maintenance requirements, users must refer to the official product manual.

DOCUMENT REVISIONS		
NO.	**DATE**	**NOTES**
REV. 1	November 5, 2026	Initial release

Notice of publication

The information contained in this document may be subject to change without notification. For more detailed information, product specifications and to download up-to-date documents, visit our website at www.movesolutions.it.

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