DynaLogger HF+

PN 101110 | NCM 9027.89.99 | HS 9002789

Datasheet Mar. 2023

Overview

The DynaLogger **HF+** is designed to identify failure mode symptoms or defects in machinery and equipment in **a wide variety of field applications**. Due to its broad frequency spectrum, the HF+ delivers complete triaxial vibration and temperature monitoring for l**ow to high-speed equipment**. In addition, the solution features an **online platform**, with no local installation required, with several tools that assist in data analysis and enable constant monitoring of asset health.

The **HF+** DynaLogger has two monitoring modes: spectral/waveform and telemetry. Configurable **telemetry monitoring** in bands includes several metrics such as acceleration, velocity, and displacement in RMS, peak, peak to peak, and crest factor, as well as skewness, kurtosis, and contact temperature. In **spectral monitoring**, different tools can be used: spectrum, waveform (linear, circular and orbital), frequency filters, cepstrum, spectral envelope (demodulation), autocorrelation and multimetrics.

Wireless Monitoring Solution

- Compact sensor with wide frequency range.
- Long battery life.
- High resolution in frequency and amplitude.
- Over 40 telemetry metrics that can be applied in different frequency bands up to 13 kHz (under developing).
- Low speed applications (less than 10 RPM).
- Sensor with low spectral noise.
- Truly simultaneous triaxial measurement.
- Remote sensor updating.

Main assets monitored

- Motors
- Pumps
- Fans
- Gearboxes
- Rollers and Brakes
- Compressors and chillers
- Wind turbines
- Bearings in assets with high and low speed

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Technical Specifications	
Model	HF+
Dimensions	39 x 39 x 35 mm
Weight	73 g
Material	LEXAN™
Color	Blue
Mounting	Glued or Screwed
Visual Signaling (LED)	Red / Green
Accelerometer	MEMS Triaxial
Accelerometer Impact Limit	10.000 g in 0,2 ms
Operating temperature[1,2]	-20°C ≤ T ≤ 84°C
Certified operating temperature for use in explosive atmosphere	-20°C ≤ T ≤ 79°C
Certification	
Homologation / Certification	ANATEL/CE/ACMA/FCC/IC
Protection Grade	IP66/IP68/IP69
Explosive Atmosphere	Ex ma IIB T6 Ga Ex ta IIIC T85 °C Da
Battery	
Voltage	3 V
Autonomy[3]	3 to 5 years
Continuous Monitoring (Telemetry)	
Sampling Period	1 to 60 min
Monitored Metrics ***Under developing**	RMS Acceleration, Peak* and Peak to Peak*
	RMS Velocity, Peak* and Peak to Peak*
	RMS Displacement, Peak* and Peak to Peak*
	Acceleration Skewness*
	Acceleration Kurtosis*
	Acceleration Crest factor (CF)*
	Acceleration Crest factor + (CF+)*
	Contact Temperature
Temperature resolution	0,01°C
Frequency Bands	2 Hz to 13 kHz (configurable)
Monitoring Profiles[4]	2 profiles
Frequency Response (± 3 dB)	7,6 kHz
Dynamic Range	Up to ±16 g
Memory[5]	51.200 samples (configurable)
Communication and System	
Bluetooth	BLE 5.3 / 2400 – 2483,5 MHz
Free Field Range[6]	100 m
RF Output Power	0,4 dBm
App Communication	Android and iOS

1 It is possible to monitor assets whose temperature exceeds 84°C, especially assets with intermittent characteristics and with room temperature below 24°C. However, Dynamox does not provide warranty in these cases. Specific condition for application outside explosive atmospheres. **2** The application at temperatures below 0°C impacts the battery autonomy. This effect worsens the lower the temperature, estimating a reduction of about 50% of useful life in applications at -20°C. Specific condition for application outside explosive atmospheres. **3** Estimated value for a standard monitoring condition with 1 or 2 daily spectral collections, telemetry intervals of 5 to 30 minutes and operating temperature between 20°C and 60°C. **4** Monitoring profiles can be understood as set configurations of vibration metrics (in velocity, acceleration and displacement) in a given frequency band. **5** Each telemetry metric corresponds to the allocation of a sample in memory. In practice, the time to fill the memory depends on the sample interval and number of metrics configured. It is important to remember that when a data collection is performed (App or Gateway), the memory is emptied. **6** Reference in free field. Bluetooth communication distance may vary with obstacles, interference and device (cell phone or Gateway)

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Spectral Monitoring and Waveform

Analysis Tools	Spectrum
	Frequency filters
	Envelope (demodulation)
	Cepstrum
	Spectral Waterfall
	Autocorrelation
	Circular and orbital waveform
	Advanced metrics: Multiband RMS, envelope, velocity and acceleration in peak to peak and kurtosis, FC, FC+, Haystack energy
Frequency Response (± 5%)	7 kHz
Frequency Response (± 3dB)	7,6 kHz
Spectral noise density	< 75 µg/√Hz
Sample Rate	Up to 26 kHz
Minimum Frequency Resolution	0,006 Hz (8 bits) and 0,012 Hz (16 bits)
Minimum Resolution in Amplitude[1]	16 mg (8 bits) and 61 µg (16 bits)
Amplitude Range	Up to ±16 g
Lines of Resolution (LOR)	98.304 (uniaxial) and 32.768 (triaxial)
Maximum Frequency	571 Hz to 13 kHz (configurable)
Maximum Collection Time[2]	172,2 s (uniaxial) and 57,3 s (triaxial)

Spectral Monitoring Settings

Triaxial Simultaneous

Max. Freq. (Hz)	Duration (s)						RPM min. [3]
13.145	0,08	0,16	0,31	0,62	1,25	2,5	24,0
6.572	0,16	0,31	0,62	1,25	2,5	5,0	12,0
2.629	0,4	0,8	1,6	3,1	6,2	12,5	4,8
1.314	0,8	1,6	3,1	6,2	12,5	24,9	2,4
571	1,8	3,6	7,2	14,3	28,7	57,3	1,0
N. Lines	1.024	2.048	4.096	8.192	16.384	32.768*	-

Uniaxial

Max. Freq. (Hz)	Duration (s)								RPM min. [3]
13.145	0,08	0,16	0,31	0,62	1,25	2,5	3,7	7,5	8,0
6.572	0,16	0,31	0,62	1,25	2,5	5,0	7,5	15,0	4,0
2.629	0,4	0,8	1,6	3,1	6,2	12,5	18,7	37,4	1,6
1.314	0,8	1,6	3,1	6,2	12,5	24,9	37,4	74,8	0,8
571	1,8	3,6	7,2	14,3	28,7	57,3	86,0	172,0	0,3
N. Lines	1.024	2.048	4.096	8.192	16.384	32.768	49.152	98.304*	-

1 - Calculated amplitude resolution is based on the accelerometer digital output in µg/LSB or mg/LSB.
2 - Check the setting in the 'Spectral Monitoring Settings' table.
3 - Minimum RPM based on the longest measurement considering one full revolution of the shaft.
* - Setting available with 8 bits of amplitude resolution

ANATEL CE

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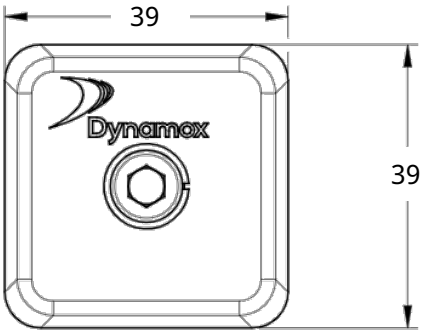
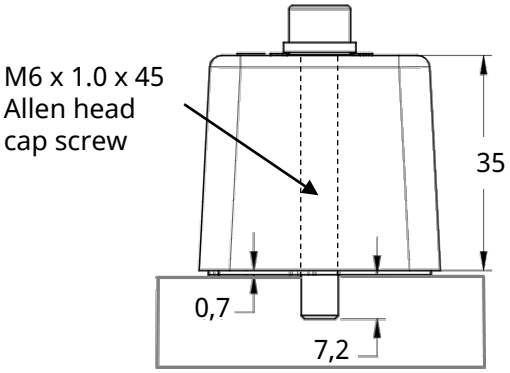
Geometric dimensions



Dimensions in millimeters



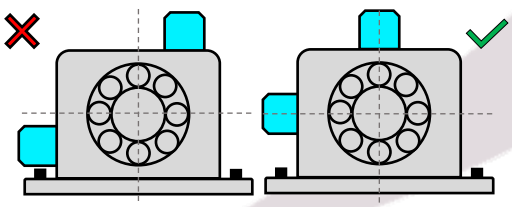
Quick Mounting Guide

- Define the critical points of the machines to be monitored for the DynaLoggers installation;

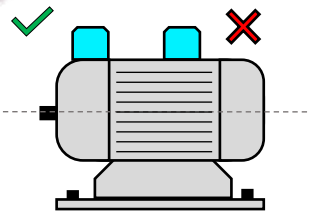
- It is only necessary to install one DynaLogger per monitoring point, because the devices are triaxial;

- Avoid installation in areas of the housings that presents any stiffness loss. Example: cooling fins, covers, and protections. Try to install in rigid parts of the machine, preferably near the bearings;

- Align one of the axes of the DynaLogger with the actual axis of the machine. These axes are shown in the schematic above and on the body of the devices. A detailed installation guide can be found at Dynamox's support website.



It is recommended, as much as possible, to install the DynaLoggers centrally in the component.



Installation on cooling fins and covers is not recommended.
Note: For motors, the recommendation is to install a sensor on the coupled side and another one on the opposite side for complete monitoring.

Regarding the types of mounting, the HF+ DynaLogger can be:

Screwed: M6 screw with a length that allows a minimum 7.2 mm depth to the drilled surface. It is recommended to use a spring washer and to apply a 11 N-m torque.

Glued: After cleaning the site, apply adhesive glue to cover the entire sensor base. Dynamox recommends the adhesives DP8810, DP8710 and DP420 from 3M.

Magnetic Basis: Can be used in occasional cases where easy removal is desired. Not recommended for permanent installations, due to loss of high frequency response.

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DAT-HF+:032023-00/EN - [PUBLIC DOCUMENT]