

DynaLogger TcAs

PN 101100 | NCM 9027.89.99 | HS 9002789

Datasheet Mar. 2023



Overview

The **TcAs** DynaLogger is designed to identify failure mode symptoms or defects in **machinery and equipment in general** according to ISO 20816. In addition, with **triaxial spectra** and contact temperature sensor, the **TcAs** is able to monitor unusual **equipment and structures such as suspensions, servers, pipes and valves**. Additionally, the solution has an **online platform**, with no need for local installation, with several tools that assist in data analysis and allow for constant monitoring of asset health.

The **TcAs** DynaLogger has two monitoring modes: spectral/waveform and telemetry. Band configurable **telemetry monitoring** 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 multi-metrics.

Wireless Monitoring Solution

-  One of the smallest sensors on the market.
-  Long battery life.
-  Easy mounting.
-  High spectral resolution up to 91200 spectral lines.
-  More than 40 telemetry metrics that can be applied in different frequency bands up to 2.5 kHz (under development).
-  Monitoring of rotating machines in general according to ISO 20816.
-  True simultaneous triaxial measurement.
-  Remote sensor updating.

Main assets monitored

- Motors
- Pumps
- Fans
- Machine structures: chassis, suspensions and springs, rails, etc.
- Pulleys and roller bearing housing
- Cardan shafts
- Bearings (more advanced defects - stage 3 or 4)



Technical Specifications

Model	TcAs
Dimensions	36,6 x 33,6 x 18,7 mm
Weight	33,8 g
Material	LEXAN™
Color	Verde
Mounting	Glued
Visual Signaling (LED)	Red / Green
Accelerometer	MEMS Triaxial
Impact Limit	3.000 g in 0,5 ms
Recommended temperature range^{1,2}	-20°C ≤ T ≤ 84°C

Certification

Homologation / Certification	ANATEL/CE/ACMA/FCC/IC
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Battery

Voltage	3 V
Autonomy³	3 to 5 years

Continuous Monitoring (Telemetry)

Sampling Period	1 to 60 min
Monitored Metrics *Under development	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	3 Hz to 2,5 kHz (configurable)
Monitoring Profiles⁴	2 profiles
Frequency Response (± 3 dB)	2 kHz
Dynamic Range	Up to ±16 g
Memory⁵	51.200 samples (configurable)

Communication and System

Bluetooth	BLE 5.3 / 2400 – 2483,5 MHz
Free Field Range⁶	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.

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.

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)



Monitoramento espectral e forma de onda

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+, Carpet energy.
Frequency Response ($\pm 5\%$)	2 kHz
Frequency Response ($\pm 3\text{dB}$)	2,1 kHz
Spectral noise density	< 220 $\mu\text{g}/\sqrt{\text{Hz}}$
Sample Rate	Up to 5.040 kHz
Minimum Frequency Resolution	0,012 Hz
Minimum Resolution in Amplitude¹	16 mg
Amplitude Range	Up to ± 16 g
Lines of Resolution (LOR)	91.200 (uniaxial) and 30.400 (triaxial)
Maximum Frequency	1.260 Hz and 2.520 Hz (configurable)
Maximum Collection Time²	72,4 s (uniaxial) and 24,1 s (triaxial)

Spectral Monitoring Settings Triaxial Simultaneous

Max. Freq. (Hz)	Duration (s)						RPM min. ³
2.520	0,41	0,81	1,63	3,25	6,5	12,1	5,0
1.260	0,81	1,63	3,25	6,5	13,0	24,1	2,5
N. lines	1.024	2.048	4.096	8.192	16.384	30.400	-

Uniaxial

Max. Freq. (Hz)	Duration (s)								RPM min. ³
2.520	0,41	0,81	1,6	3,3	6,5	13,0	19,5	36,2	1,7
1.260	0,81	1,6	3,3	6,5	13,0	26,0	39,0	72,4	0,8
N. lines	1.024	2.048	4.096	8.192	16.384	32.768	49.152	91.200	-

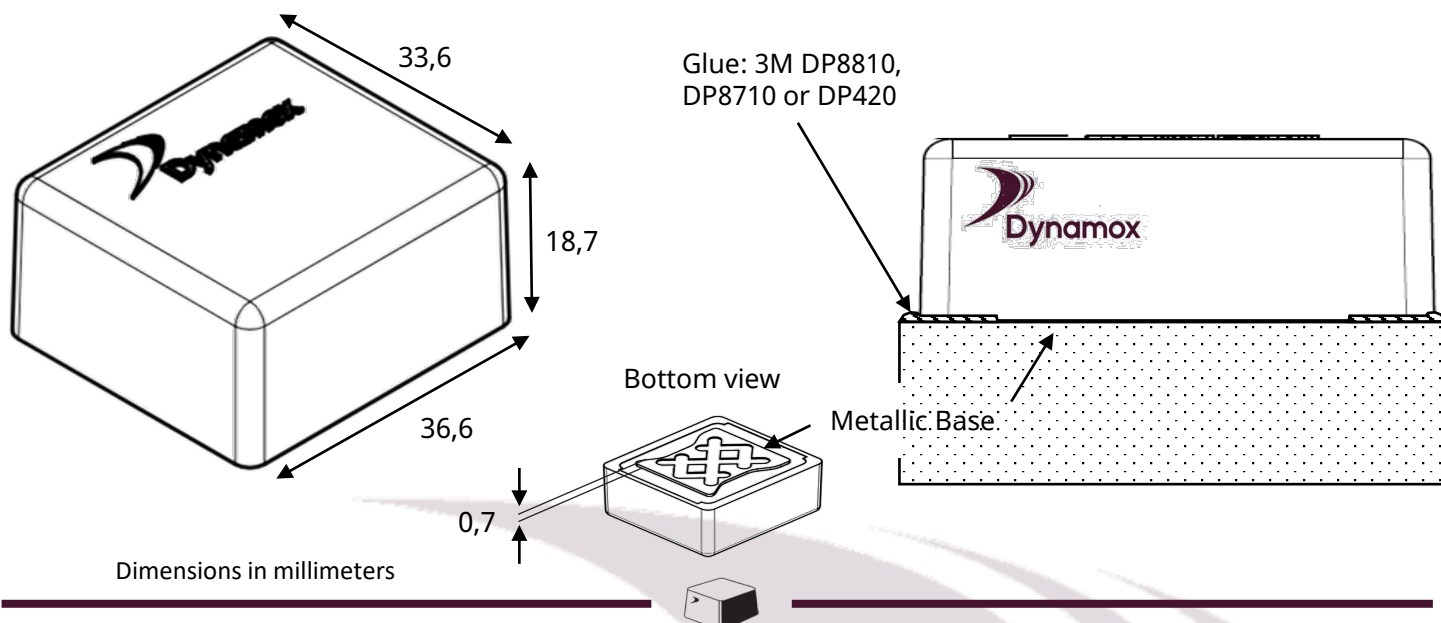
1 - Calculated amplitude resolution is based on the accelerometer digital output in $\mu\text{g}/\text{LSB}$ or mg/LSB .

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.

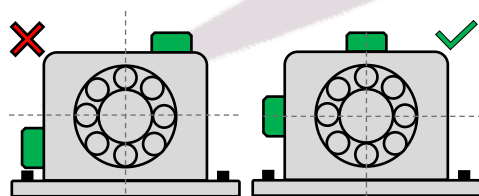
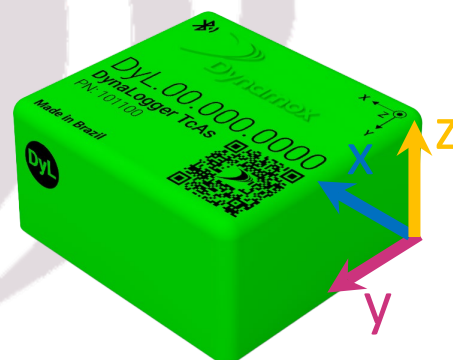


Geometric dimensions

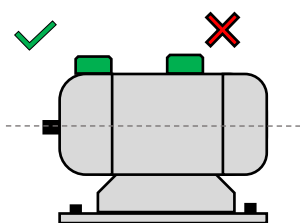


Quick Mounting Guide

- 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](https://www.dynamox.net/support).



It is recommended to install the DynaLogger centrally on 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 TcAs DynaLogger can be:

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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