

# DynaLogger TcAs

PN 101100 | NCM 9027.89.99 | HS 9002789

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## 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

<b>Model</b>	TcAs
<b>Dimensions</b>	36,6 x 33,6 x 18,7 mm
<b>Weight</b>	33,8 g
<b>Material</b>	LEXAN™
<b>Color</b>	Verde
<b>Mounting</b>	Glued
<b>Visual Signaling (LED)</b>	Red / Green
<b>Accelerometer</b>	MEMS Triaxial
<b>Impact Limit</b>	3.000 g in 0,5 ms
<b>Operating temperature<sup>1,2</sup></b>	-20°C ≤ T ≤ 84°C
<b>Certified operating temperature for use in explosive atmosphere</b>	-20°C ≤ T ≤ 79°C

## Certification

<b>Homologation / Certification</b>	ANATEL/CE/ACMA/FCC/IC
<b>Protection Grade</b>	IP66/IP68/IP69
<b>Explosive Atmosphere</b>	Ex ma IIB T6 Ga Ex ta IIIC T85 °C Da

## Battery

<b>Voltage</b>	3 V
<b>Autonomy<sup>3</sup></b>	3 to 5 years

## Continuous Monitoring (Telemetry)

<b>Sampling Period</b>	1 to 60 min
<b>Monitored Metrics</b> <b>*Under development</b>	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
<b>Temperature resolution</b>	0,01°C
<b>Frequency Bands</b>	3 Hz to 2,5 kHz (configurable)
<b>Monitoring Profiles<sup>4</sup></b>	2 profiles
<b>Frequency Response (± 3 dB)</b>	2 kHz
<b>Dynamic Range</b>	Up to ±16 g
<b>Memory<sup>5</sup></b>	51.200 samples (configurable)

## Communication and System

<b>Bluetooth</b>	BLE 5.3 / 2400 – 2483,5 MHz
<b>Free Field Range<sup>6</sup></b>	100 m
<b>RF Output Power</b>	0,4 dBm
<b>App Communication</b>	Android and iOS

<sup>1</sup> 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. <sup>2</sup> 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. <sup>3</sup> 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. <sup>4</sup> Monitoring profiles can be understood as set configurations of vibration metrics (in velocity, acceleration and displacement) in a given frequency band. <sup>5</sup> 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. <sup>6</sup> Reference in free field. Bluetooth communication distance may vary with obstacles, interference and device (cell phone or Gateway)



## Monitoramento espectral e forma de onda

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

### Spectral Monitoring Settings Triaxial Simultaneous

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

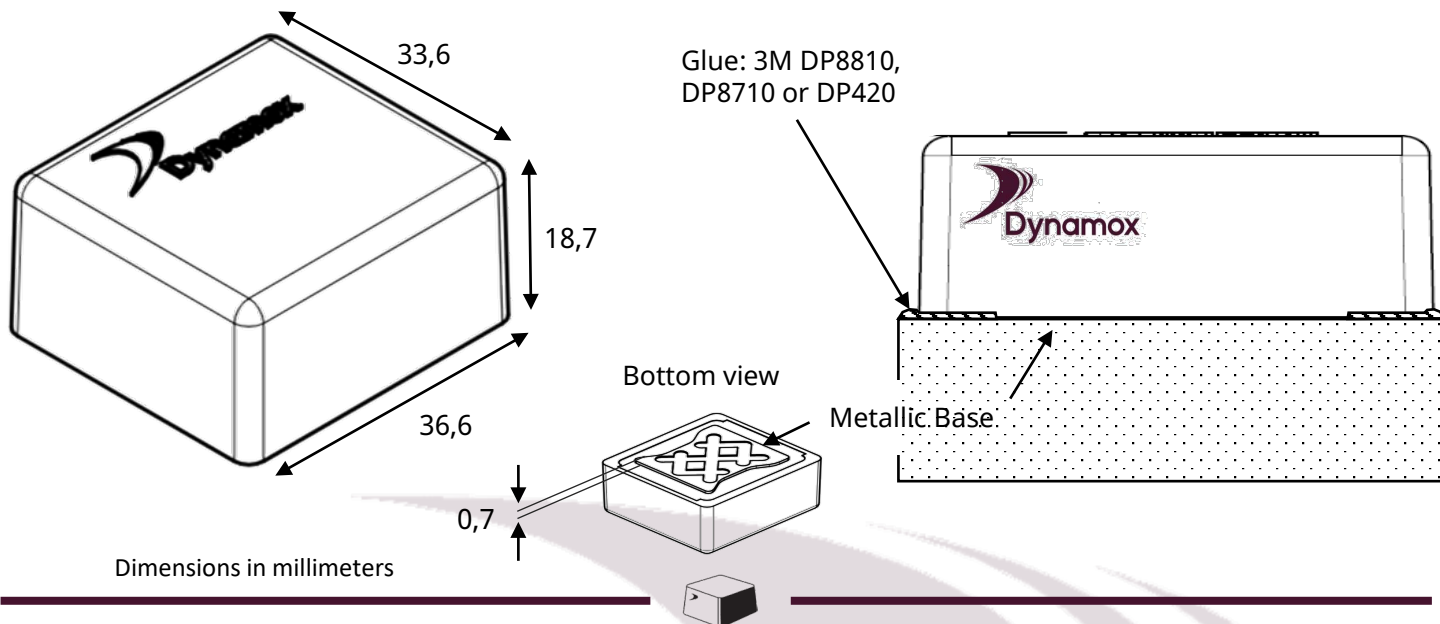
### Uniaxial

Max. Freq. (Hz)	Duration (s)								RPM min. <sup>3</sup>
<b>2.520</b>	0,41	0,81	1,6	3,3	6,5	13,0	19,5	36,2	1,7
<b>1.260</b>	0,81	1,6	3,3	6,5	13,0	26,0	39,0	72,4	0,8
<b>N. lines</b>	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  $\text{mg}/\text{LSB}$ .  
 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.

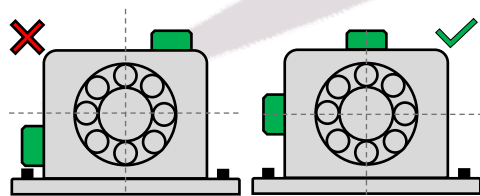


## Geometric dimensions

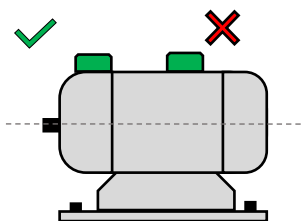


## Quick Mounting Guide

- 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](#).



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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