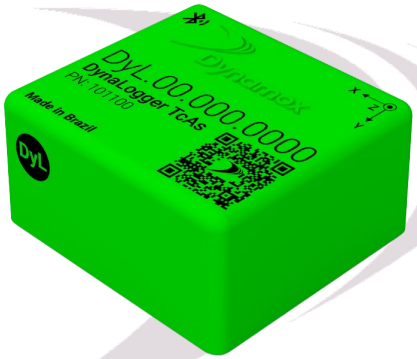
# DynaLogger TcAs

**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)

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| 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 |
| **Battery** | |
| **Voltage** | 3 V |
| **Autonomy[3]** | 3 to 5 years |
| **Continuous Monitoring (Telemetry)** | |
| **Sampling Period** | 1 to 60 min |
| **Monitored Metrics**<br>***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 Profiles[4]** | 2 profiles |
| **Frequency Response (± 3 dB)** | 2 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.
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 (± 5%)** | 2 kHz |
| **Frequency Response (± 3dB)** | 2,1 kHz |
| **Spectral noise density** | < 220 µg/√Hz |
| **Sample Rate** | Up to 5.040 kHz |
| **Minimum Frequency Resolution** | 0,012 Hz |
| **Minimum Resolution in Amplitude[1]** | 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 Time[2]** | 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 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.

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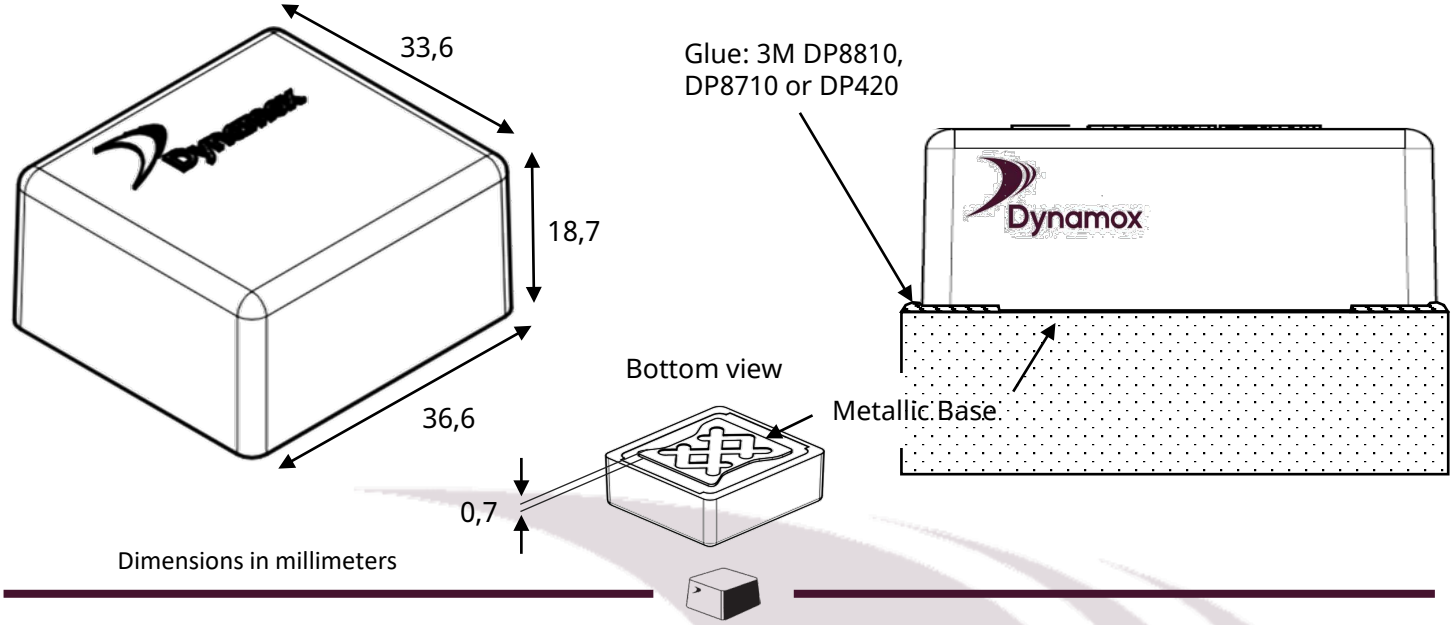
# Geometric dimensions



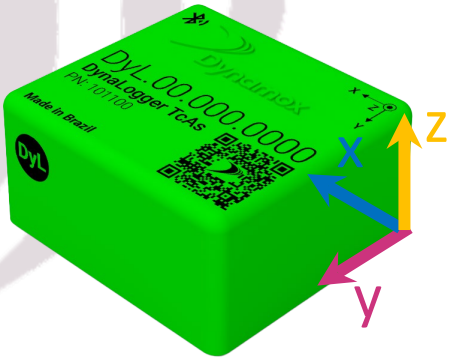

Dimensions in millimeters

# Quick Mounting Guide

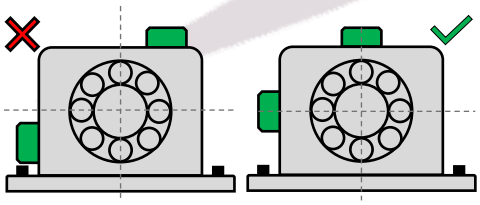
- Define the critical points of the machines to be monitored for the DynaLoggers installation;

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

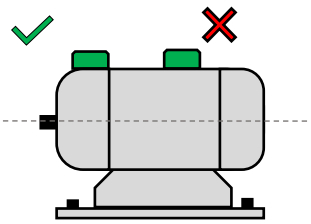
- Avoid installation in areas of the housings that presents any stiffness loss. Example: cooling fins, covers, and protections. Try to install in rigid parts of the machine, preferably near the bearings;




- 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 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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