DynaLogger TcAs

PN 101100| NCM 9027.89.99 | HS 9002789 **Datasheet 2024.04**

Overview

The wireless **TcAs** sensor 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 IoT sensor **TcAs** 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.

IoT 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)

Parque Tec. Alfa - Rod. José Carlos Daux, N° 600, KM 01 | Módulo 05 | CEP: 88030-909
Florianópolis – SC | Brasil | Tel.: (48) 3024-5858 | www.dynamox.net

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
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]	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 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 / 2,400 – 2,483.5 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 daily spectral collection, telemetry intervals of 5 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)

Parque Tec. Alfa - Rod. José Carlos Daux, N° 600, KM 01 | Módulo 05 | CEP: 88030-909
Florianópolis – SC | Brasil | Tel.: (48) 3024-5858 | www.dynamox.net

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

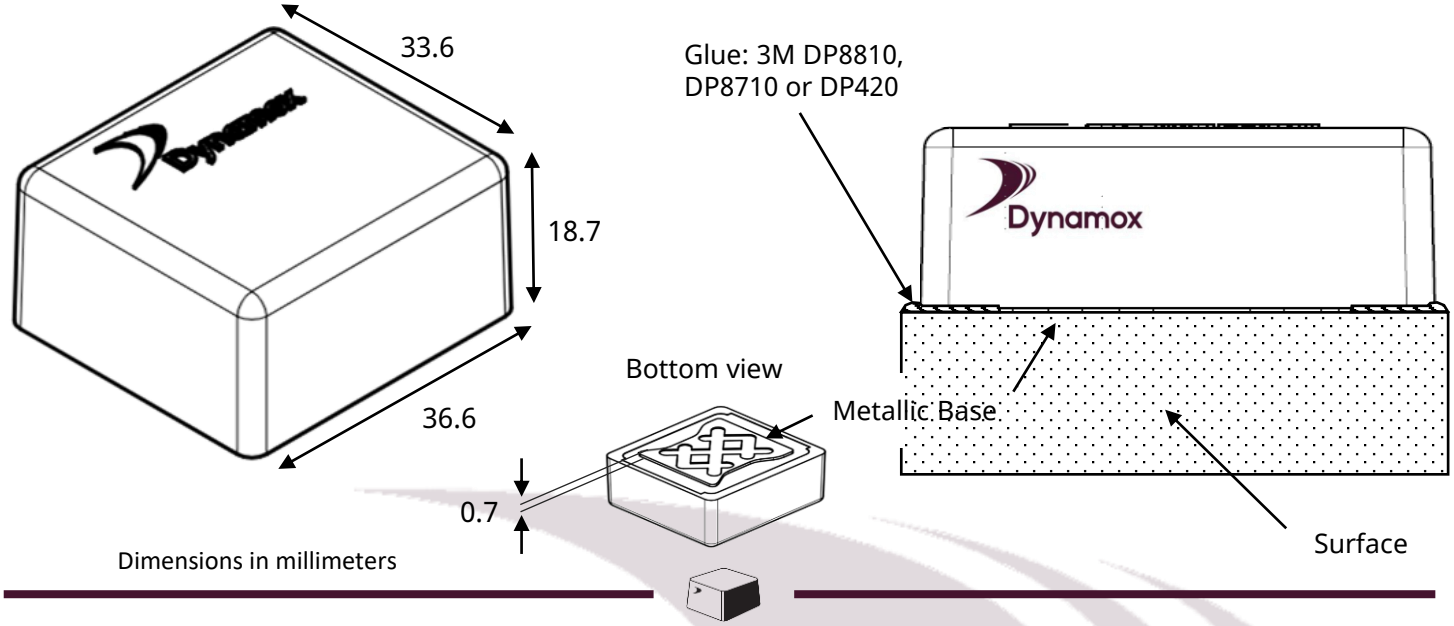
Max. Freq. (Hz)	Duration (s)								RPM min.[3]
2,520	0.41	0.81	1.6	3.3	6.5	13.0	19.5	36.2	1.7
1,260	0.81	1.6	3.3	6.5	13.0	26.0	39.0	72.4	0.8
N. lines	1,024	2,048	4,096	8,192	16,384	32,768	49,152	91,200	-

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.

ANATEL CE

Parque Tec. Alfa - Rod. José Carlos Daux, N° 600, KM 01 | Módulo 05 | CEP: 88030-909
Florianópolis – SC | Brasil | Tel.: (48) 3024-5858 | www.dynamox.net

Geometric dimensions

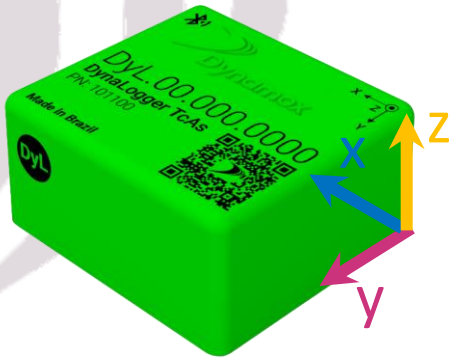


Dimensions in millimeters

Quick Mounting Guide

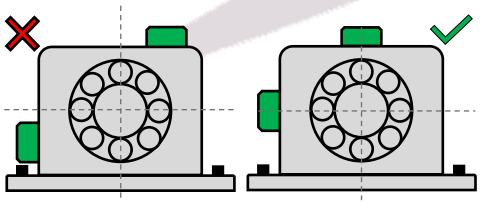
- Define the critical points of the machines to be monitored for the DynaLoggers installation;

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

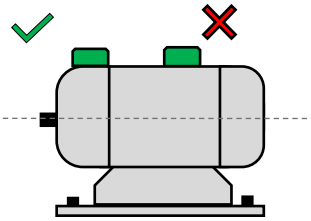


- Avoid installation in areas of the housings that presents any stiffness loss. Example: cooling fins, covers, and protections. Try to install in rigid parts of the machine, preferably near the bearings;

- 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.

Parque Tec. Alfa - Rod. José Carlos Daux, N° 600, KM 01 | Módulo 05 | CEP: 88030-909
Florianópolis – SC | Brasil | Tel.: (48) 3024-5858 | www.dynamox.net

Dynamox recommends that at the end of the devices' useful life, disposal is carried out in accordance with local legislation applicable to electronic products.

The contents of this publication are presented for informational purposes only. Every care has been taken to ensure the validity of the information contained in this publication, but no liability can be assumed for any loss or damage whether direct, indirect or consequential arising out of the use of the information contained herein. We reserve the right to modify or improve the specifications of our products at any time without notice.

Contact Us
www.dynamox.net/contact-us

DAT-TCAS: 112023-00/EN - [PUBLIC DOCUMENT]