









DynaLogger TcAs

PN 101100 | NCM 9027.89.99 | HS 9002789

Datasheet 2024.08



Overview

The wireless **TcAs** sensor is designed to identify symptoms or defects mode machinery and equipment according to ISO 20816. In addition, with triaxial spectra and contact temperature sensor, the **TCAs** is able to monitor unusual equipment and structures such 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)



















| Model TCAS Dimensions 36.6 x 33.6 x 18.7 mm 33.6 x 33.6 x 18.7 mm 33.8 g 34 33.8 g 34 34 34 34 34 35 36 37 38 37 38 38 38 38 38 | | Technical Specifications | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|
| 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 -10°C ≤ T ≤ 84°C Certified operating temperature for use in explosive atmosphere -10°C ≤ T ≤ 79°C Certification Homologation / Certification ANATEL/CE/ACMA/FCC/IC/INMETRO* *For information about other certifications, please refer to the last page Protection Grade IP66/IP68/IP69 Ex ma IIB T6 Ga Ex ta IIIC T85 °C Da Battery Voltage 3 V Autonomy³ 5 years Continuous Monitoring (Telemetry) Sampling Period 1 to 60 min RMS Acceleration, Peak* and Peak to Peak* RMS Velocity, Peak* and Peak to Peak* RMS Displacement, Peak* and Peak to Peak* *Under development Acceleration Skewness* *Celeration Crest factor (CF)* Acceleration Crest factor + (CF+)* Contact Temperature Temperature | | i e | | | | | | | | |
| Material LEXAN™ | Dimensions | 36.6 x 33.6 x 18.7 mm | | | | | | | | |
| Material LEXAN™ | Weight | | | | | | | | | |
| Mounting Glued | | LEXAN TM | | | | | | | | |
| Visual Signaling (LED) Red / Green Accelerometer MEMS Triaxial Impact Limit 3,000 g in 0.5 ms Operating temperature¹¹² -10°C ≤ T ≤ 84°C Certifical operating temperature for use in explosive atmosphere -10°C ≤ T ≤ 79°C Kertification Homologation / Certification ANATEL/CE/ACMA/FCC/IC/INMETRO* | Color | Verde | | | | | | | | |
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| Certified operating temperature for use in explosive atmosphere Certification Homologation / Certification ANATEL/CE/ACMA/FCC/IC/INMETRO* | | | | | | | | | | |
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| Certification Homologation / Certification Protection Grade Explosive Atmosphere Exp | Certified operating temperature for | 10°C < T < 70°C | | | | | | | | |
| ANATEL/CE/ACMA/FCC/IC/INMETRO* *For information about other certifications, please refer to the last page | use in explosive atmosphere | -10 C S 1 S /9 C | | | | | | | | |
| ANATEL/CE/ACMA/FCC/IC/INMETRO* *For information about other certifications, please refer to the last page | Certi | fication | | | | | | | | |
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| Memory⁵ 51,200 samples (configurable) | Continuous Mon Sampling Period Monitored Metrics *Under development Temperature resolution Frequency Bands Monitoring Profiles ⁴ | toring (Telemetry) 1 to 60 min 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 0.01°C 3 Hz to 2.5 kHz (configurable) 2 profiles | | | | | | | | |

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.



















| Communication and System | | | | | | | | | | | | | |
|---|--|---------|---------|-----------------|---|-------------------------------|-------------------|-------|----------|------------|-------------------|--|--|
| Bluetooth | | | | | | BLE 5.3 / 2,400 – 2,483.5 MHz | | | | | | | |
| Free Field F | Range ¹ | | | | | 100 m | | | | | | | |
| RF Output | | | | | | 0.4 dBm | | | | | | | |
| App Communication | | | | | | droid a | and i | OS | | | | | |
| Monitoramento espectral e forma de onda | | | | | | | | | | | | | |
| | | | | | Spe | ectrum | 1 | | | | | | |
| | | | | | | equenc | y filt | ers | | | | | |
| | | | | | Env | velope | (der | nod | ulation) | | | | |
| | | | | | Ce | pstrum | 1 | | | | | | |
| Analysis To | ols | | | | Spe | ectral \ | Nate | rfall | | | | | |
| Allalysis 10 | UIS | | | | Au | tocorre | elatio | on | | | | | |
| | | | | | Cir | cular a | nd o | rbit | al wave | form | | | |
| | | | | | Ad | vanced | d me | trics | : Multik | and RMS, | envelope, | | |
| | | | | | vel | ocity a | nd a | ccel | eration | in peak to | peak and | | |
| | | | | | kuı | rtosis, | FC, F | C+, (| Carpet | energy. | | | |
| Frequency | | | | | 2 k | Ήz | | | | | | | |
| Frequency | | | dB) | | 2.1 | kHz | | | | | | | |
| Spectral no | ise den | sity | | | < 220 µg/√Hz | | | | | | | | |
| Sample Rat | Sample Rate | | | | | | Up to 5,040 kHz | | | | | | |
| Minimum F | | | | | 0.012 Hz | | | | | | | | |
| Minimum F | Resoluti | on in A | mplitud | le ² | 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 (| Maximum Collection Time ³ 72.4 s (uniaxial) and 24.1 s (triaxial) | | | | | | | | | | | | |
| Spectral Monitoring Settings | | | | | | | | | | | | | |
| | | | Tr | iaxial S | im | ultane | ous | | | | | | |
| Max. | | | | Dur | ati | on (s) | | | | | RPM | | |
| Freq. (Hz) | Dui | | | | | 011 (3) | min. ⁴ | | | | | | |
| 2,520 | 0.41 | |).81 | 1.63 | | 3.25 | 5 | 6.5 | | 12.1 | 5.0 | | |
| 1,260 | 0.81 | | .63 | 3.25 | | 6.5 | | | 3.0 | 24.1 | 2.5 | | |
| N. lines | 1,024 | 2 | ,048 | 4,096 | | 8,19 | 2 16,3 | | ,384 | 30,400 | - | | |
| Uniaxial | | | | | | | | | | | | | |
| Max. | | | | Dur | ati | on (s) | | | | | RPM | | |
| Freq. (Hz) | | | | | | | | _ | | | min. ⁴ | | |
| 2,520 | 0.41 | 0.81 | 1.6 | 3.3 | \bot | 6.5 | 13 | .0 | 19.5 | 36.2 | 1.7 | | |

1 - Reference in free field. Bluetooth communication distance may vary with obstacles, interference and device (cell phone or Gateway). **2** - Calculated amplitude resolution is based on the accelerometer digital output in μ g/LSB or μ g/LSB. **3** - Check the setting in the 'Spectral Monitoring Settings' table. **4** - Minimum RPM based on the longest measurement considering one full revolution of the shaft.

13.0

16,384

6.5

8,192





1,260

N. lines





0.81

1,024

1.6

2,048

4,096

26.0

32,768

39.0

49,152

72.4

91,200

8.0



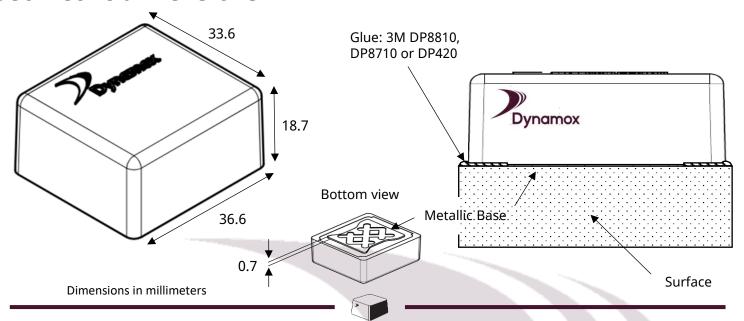








Geometric dimensions

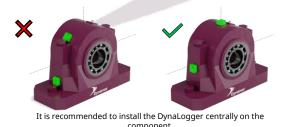


Quick Mounting Guide

- 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 <u>support website</u>.







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.



















Certification/Countries

INMETRO, FCC, CE, ACMA, IC, MTC, IFETEL, SUBTEL, ICASA, WPC, RSM SDoC, CITC, CE Turkey, ASEP, ZICTA, AMRTP, ARM, INCM, UKCA, VoC, SDDPI, EAC

Brazil, USA, Austria, Belgium, Bulgaria, Cyprus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Australia, Canada, Peru, Mexico, Chile, South Africa, India, New Zealand, Saudi Arabia, Turkey, Panama, Zambia, Mali, Mauritania, Indonesia, Mozambique, Inglaterra, Scotland, Wales, Egypt, kazakhstan, Russia, Belarus, Armenia, Kyrgyzstan

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

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www.dynamox.net/contact-us

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