Tyre Cavity Accelerometer Type TCA®

Product Data and Specification

Applications:

- Tyre structural vibrations
- Tyre tread acceleration
- Road noise route tracking
- Tyre coast by noise testing
- Inception of aquaplaning

Features:

- Installs securely inside the tyre
- Data immune from environmental noise
- Radio linked
- Radio controlled
- Robust design
- Retains wheel balance
- Tyres inflated as normal
- Wheels run to speeds of 160+ kph

Figure 1. TCA's accelerometer installed on tyre liner

TCA is a remote controlled radio linked accelerometer designed to capture the vibrations on the tyre liner from inside the tyre.

A TCA system comprises two small curved aluminium modules, interconnecting cable, radio receiver with integral antenna , magnetic antenna with 5 metre cable, for in vehicle recording.
The two aluminium modules are tensioned against the wheel rim by a stainless steel harness. The modules are connected by a multi-core umbilical cable that includes the antenna.

The TCA is controlled by a radio key fob. On standby the TCA battery lasts 6 days and when transmitting continuously 8 hours. It can be turned off between recordings to allow recording over several days.

The radio receiver, with BNC socket, provides an output signal suitable for most analysis and recording systems.

The radio link range is dependant on wheel and body screening but is typically > 10 metres.

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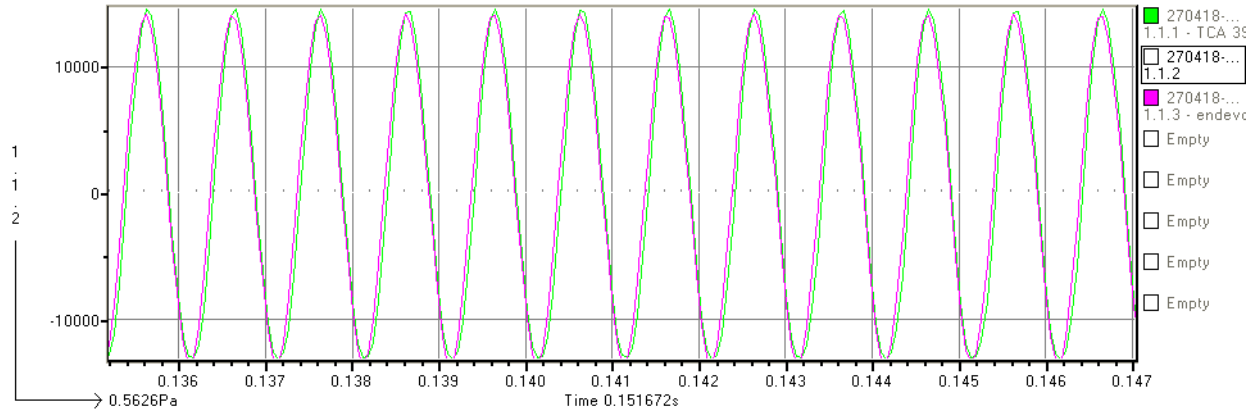
Time domain comparisons

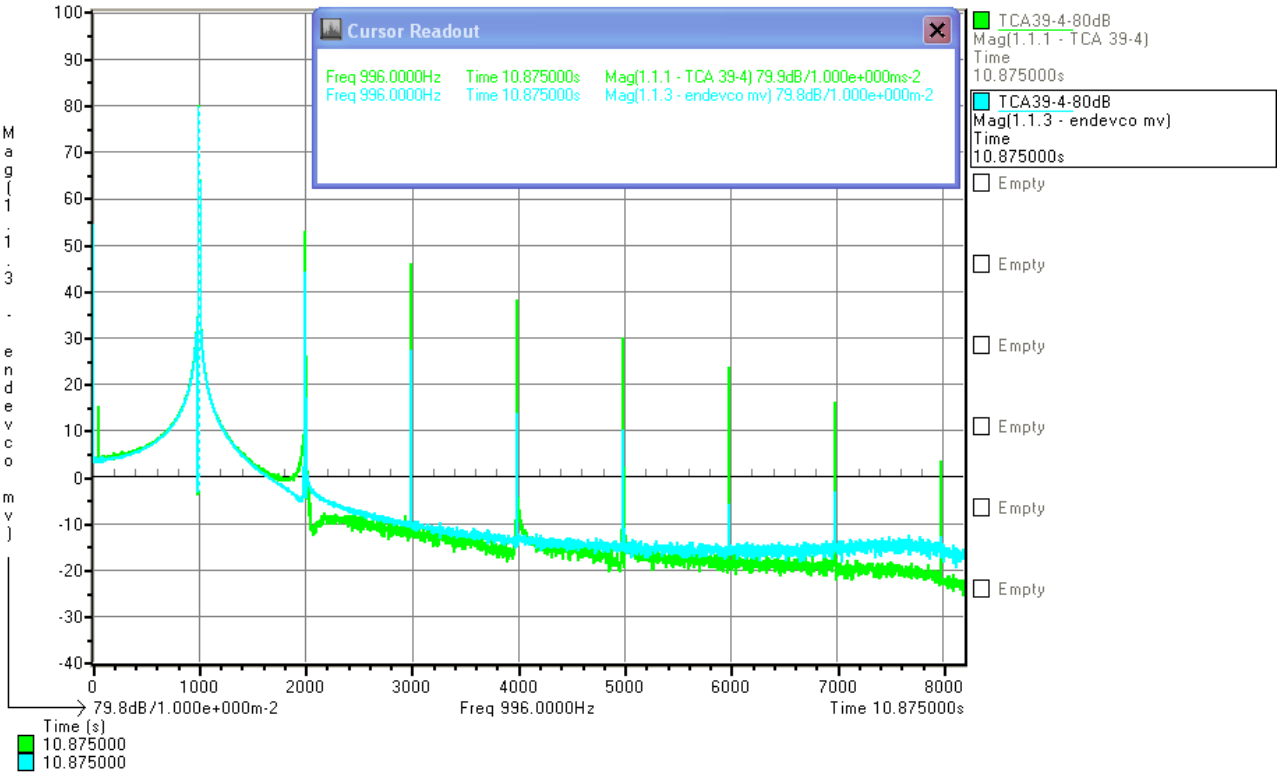
Time history at 10,000ms^{-2} (= +80dB ref 1ms^{-2})



Green = TCA transmitted signal, Purple = Reference signal from calibrator

Frequency domain measurements

At an indicated input level of +80dB (10,000 ms^{-2}) the ref signal measured 79.8dB and the TCA measured, over it's radio link, 79.9dB see below.



Green = TCA transmitted signal, Cyan= Reference signal from calibrator

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Specifications

Values quoted for 21 degrees C

Nominal sensitivity:
At 1kHz ..... 0.02 mV per ms^{-2}
Frequency Response +/- 2dB *50Hz-10kHz*
Upper limit of dynamic range ..... 10,000 ms^{-2} (rms)
dynamic range..... 80dB
Temperature range..... -10˚C to + 60˚C
Output Impedance.....< 50 Ohm
Output..... BNC
Umbilical/Antenna Cable length..... 500mm
Dimensions.....length=119mm, width= 44mm, thickness= 15mm
Weight.....per module..... *190 g*

Power supply.....internal rechargeable battery
Charge cycle
Stand-by time..... *8* days
Transmit time..... 8 hours
Typical combination.....2 days standby then operate for 6 hours
Predicted battery life..... 500 cycles

Radio Link
Activation radio range..... 15 metres
Data transmission range..... > 15 metres

Accessories included	*Number*
Umbilical cable with integral antenna	*2*
Vehicle external magnetic mount for antenna	*1*
5 meter RF cable (magnetic mount to BNC)	*1*
Battery charger	

Three (3) Year Warrantee extendable to five (5) years

Fitting the TCM inside the tyre cavity and the environment inside the tyre are less than benign activities. To make TCM ownership as risk free as possible Bay Systems offers a three (3) year warrantee. This can be extended to five years @ 15% of current list price.
The guarantee covers the repair or replacement of the entire TCM system, provided no seal has been broken, for all failures except the destruction of the TCM due to detachment inside the wheel or damage caused by tyre fitting machines. In the case of tyre fitting and detachment inside the wheel a replacement TCM will be offered at a 40% reduction to current list price.

N.B. As technology and requirements evolve the performance of the TCA will change; please check that you have the most recent specification and pricing information.

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