

# molex

## ROAD NOISE CANCELLATION (RNC) SENSORS

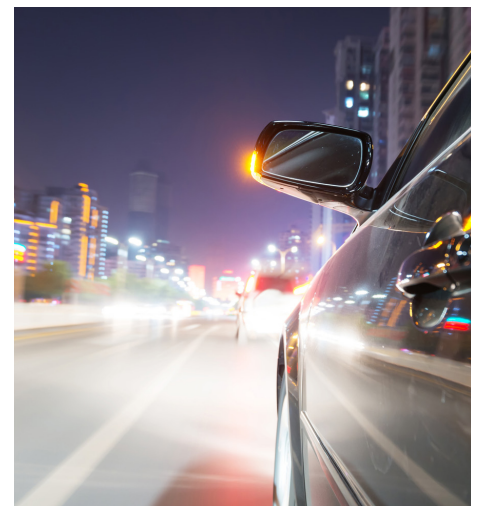
As vehicle technology changes, drivers and passengers expect a quiet in-cabin experience, one free from road-based noise pollution. A solution is now available for automotive manufacturers looking for an inexpensive, lightweight, and compact method to combat road noise.

### BUSINESS CHALLENGE

Electric and hybrid cars are making more of an impact on the automotive market as environmental concerns grow. These cars are quieter than those with combustion engines, so their occupants have indicated that they perceive higher levels of road noises.

Humming, hypnotic road noise, which is low-frequency broadband sound, transmits from road surfaces into the vehicle along through the tires, suspension and body components. Without combustion engines to mask it, road noise is more perceptible in electric vehicles. However, sound-dampening materials can be heavy and costly, and earlier active noise cancellation (ANC) systems, due to their complex wire harnesses and the material they carry, are less efficient and less economical than desired.

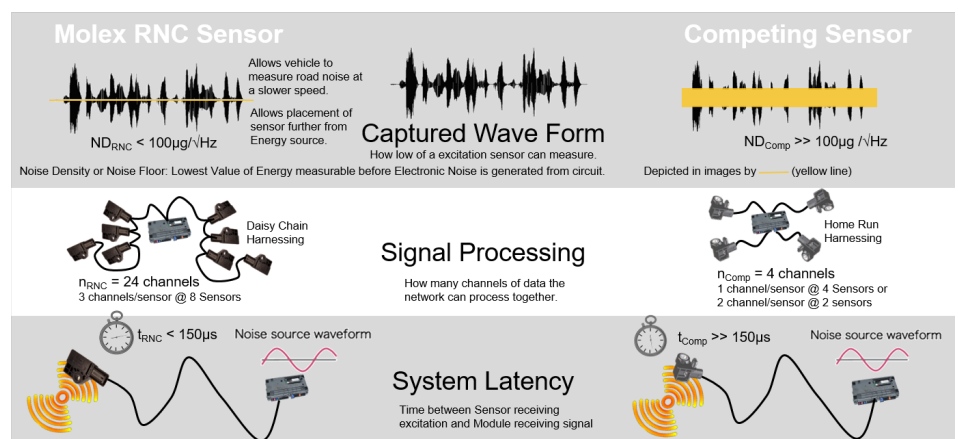
Additionally, automotive applications leave sensors and sound-dampening systems vulnerable to a variety of harsh environmental factors, like water, dust and rocks, which can damage the system.



### SOLUTION

Pioneering a new trend in the luxury electric vehicle category, Molex has created Road Noise Cancellation (RNC) Sensors, utilizing A2B technology paired with a sensing element that captures sound waves, enabling a reduction of road-based noise a combustion engine would typically mask.

RNC Sensors capture a sound wave as vehicle chassis vibration is detected and transfer it to the processing unit, which generates a cancellation wave form to the sound inside the vehicle while traveling on the road. Using A2B audio bus technology by Analog Devices, the sensors are connected through daisy-chained cabling, which eliminates the weight of heavy star-pattern or home-run wire harnessing and sound-dampening materials. The network technology minimizes the time between the sensor receiving the vibration



excitation and the processing unit receiving the signal, which means the noise is cancelled more efficiently. Plus, the sensors can measure road noise at slower speeds and be placed farther away from the sound source, while providing more network data channels as well.

Furthermore, the casings for the sensors were designed to anticipate the water and dust of the harsh automotive environment; they carry an IP6K9K enclosure rating to protect

the system, utilizing the space-saving Molex Sealed Mini50 Connector interface.

Various mechanical housing configurations offer flexibility for orienting the sensing element parallel or perpendicular to the ground, which allows for a variety of connector orientations and terminal sizes. Moreover, RNC systems can be configured with 4 to 8 sensors, depending on need.



## KEY BENEFITS

**RNC Sensors capture vibration energy from the suspension into the chassis early for optimal cancellation timing, at a lower cost than other noise cancellation systems.**

- Daisy-chained sensors, eliminating the need for heavier materials
- Less time between the sensor receiving vibrations and sending signals to the module
- An IP6K9K enclosure, protecting the sensors from harsh automotive environments
- Fifty percent space savings with the Molex Sealed Mini50 Connector interface

To learn more [www.molex.com/link/rncsensors.html](http://www.molex.com/link/rncsensors.html)

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