



# CASE STUDY

## Vibration Measurement: Wireless Portable Stroke Monitor

### THE CHALLENGE

A manufacturer of vibrating feeder equipment was purchasing a private-labelled off-the-shelf Bluetooth® Low Energy enabled accelerometer. The supplier was unable to keep up with product demand and had raised the price significantly. A lower cost solution was needed.

### THE SOLUTION

Tecnova developed a new solution using a 3-axis 16g accelerometer from Analog Devices along with a low power microcontroller and a Bluetooth® Low Energy (BLE) module. The device is powered by a lithium-ion polymer battery cell with hardware battery protection and an integrated USB-powered charger.



**“Tecnova developed a great solution. Exactly what we needed, and at a lower price.”**

### THE SUMMARY

A manufacturer of vibrating feeder equipment for the processing of bulk materials needed a portable accelerometer for use on their vibratory equipment. They initially obtained private labelled, off-the-shelf devices from a third-party manufacturer to reduce time to market. As sales increased, the third-party manufacturer significantly increased the product price, and eventually was unable to keep up with demand.

The vibrating equipment manufacturer needed to gain ownership and control of their increasingly popular product, so they engaged Tecnova to design and manufacture a replacement for the private labelled device.

After reviewing the capabilities of the original design and the customer's requirements, Tecnova created a product using an low power consumption microcontroller. It includes a Bluegiga Bluetooth® Low Energy module, and an ultralow power Analog Devices ADXL345 3-axis high-resolution  $\pm 16g$  digital accelerometer. A battery protection IC protects the single-cell prismatic lithium ion polymer battery cell from electrical damage. A battery charger IC under microprocessor control uses USB power from a Micro-USB connector to charge the battery. A strong Neodymium-Iron-Boron magnet temporarily secures the device to the vibratory equipment.

The final product provides real-time shock and vibration data to mobile applications targeting either IOS or Android devices. These enable lithium battery monitoring as well as real-time data logging with additional post-analysis functionality. The device can operate for more than a month on a single charge and is easily recharged with a standard micro-USB connector.

The low-power and low-cost design has better performance than its predecessor, and added customized functionality to meet the customer's demanding requirements.

Tecnova's customer was able to gain control and ownership of their product design and provide a better product to their customers at a lower cost.

### EXPERT SOLUTIONS. START TO FINISH.

Tecnova provides advanced, sophisticated electronic product design, engineering, and manufacturing. We specialize in projects that benefit from technical innovation and design expertise.

Tecnova manufacturing has been recognized by Quality Magazine as a top Quality Leadership 100 Company. We develop and maintain long-term relationships with our clients, working side-by-side to solve their simplest or most complex problems and to achieve their long-term strategic objectives.



## TECNOVA

Expert solutions. Start to finish.

2383 N Delany Road  
Waukegan, IL 60087 USA  
847.662.6260

[www.tecnova.com](http://www.tecnova.com)

