



# CASE STUDY

Automotive: Laser-powered tire tread depth & alignment instrument

## THE CHALLENGE

Replace a hard-wired, drive-over laser tire scanner for fixed installations with a rugged, portable, handheld, rechargeable battery powered, wireless, precision laser scanning unit with a sunlight readable, touch-screen display user interface.

## THE SOLUTION

An ARM Cortex-M4 microprocessor controlling dual precision laser distance sensors, high-throughput roaming Wi-Fi module, flexible antenna, autofocus camera, USB rechargeable protected Lithium-Ion Polymer batteries, and a low-power proprietary transfective-like backlighting portrait mode WVGA TFT LCD with resistive touch panel.



**“The breadth of expertise provided by Tecnova was uniquely capable of providing an unusually quick time to market solution.”**

## THE SUMMARY

Consumers are often weary of automotive service representative's claims that tires need to be replaced or that a costly tire alignment is required. Laser tire scanners that precisely measure the cross-sectional tread wear profile of a vehicle's tires can provide an unbiased evaluation of tread wear criticality or wheel alignment necessity.

The customer had a large, existing tire scanner design that needed to be cut into the dealer or tire center's service bay floor and hardwired for power and network access. Installation of the scanners was costly and tire scanning was limited to the locations where the scanners had been installed.

The customer contacted Tecnova to create an innovative, portable design to replace the fixed installation product. They had hopes to make an introductory “splash” at an upcoming industry trade show - then only a few months away.

Tecnova's mechanical, electronic, and embedded firmware engineering resources concurrently designed a compact, rugged system that incorporated all the customer's design requirements while considering ergonomics, user aesthetics, and technical constraints.

In the finished product, after powering up a fully charged unit, the unit logs into the local network over Wi-Fi. The built-in high resolution camera is used to take images

of the automobile's vehicle identification number and license plate. While pressing opposing buttons on the edge of the unit, it is simply “wiped” across each of the tires to scan its profile. Upon completion, the tire profile data is wirelessly transmitted to a server which provides accurate, technical feedback to the operator.

How do you measure the success of this project? Well, an early prototype of the product made the splash that the customer had hoped for. It won the industry marketing association's annual New Product Award in its category. Everywhere that this product has been put into service, sales are up!

## EXPERT SOLUTIONS, START TO FINISH

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

Tecnova 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

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