ignion

BERRY®

HEALTHCARE

Achieving reliable Bluetooth® in a wrist oximeter

How Berry® delivered a strong signal and extended battery life in an ultra-compact medical device with Ignion's antenna technology

Shanghai Berry Electronic Technology Co., Ltd., a medical device company developed the BM2000 wrist pulse oximeter, a compact and lightweight device suitable for continuous monitoring in both clinical and home settings.

The product can be connected to the Blood Oxygen Treasure APP through Bluetooth for analysis and feedback.

THE RESULTS

Antenna integration in a 50 x 30 mm PCB
Miniature NANO mXTEND™ antenna seamlessly fit the wrist-worn design without compromising Bluetooth® connectivity.

Final design enabling extended battery life
Optimized low-power configuration delivers uninterrupted operation with a rechargeable lithium battery with a 16-hour continuous runtime.

Accelerated tuning and certification with Oxion™ and engineering support
AI-guided tuning and expert engineering cut development cycles and de-risked regulatory approvals.

Return loss optimization despite battery proximity
Custom matching network achieved strong signal performance even alongside the lithium battery.

THE CHALLENGE

Berry® pursuit of reliable wireless connectivity

For more than two decades, Shanghai Berry Electronic Technology Co. Ltd. has built a reputation for developing highly reliable medical products such as multi-parameter monitors, OEM modules and pulse oximeters.

This philosophy shaped the development of the BM2000 wrist pulse oximeter, a lightweight device designed to make continuous blood oxygen monitoring easier than ever. But creating a product that small came with a formidable set of technical hurdles.

Solving these challenges demanded more than engineering expertise. Berry needed a fresh approach to antenna integration that could deliver reliable Bluetooth® connectivity.

Berry® R&D team needed to:

- Ensure reliable Bluetooth connectivity, so real-time health data could flow seamlessly.
- Fit the entire system onto a 50 mm x 30 mm PCB.
- Optimize for ultra-low power consumption to extend battery life.

"Standardization, small size, and high performance were the key factors for us to choose Ignion and the engineering service support greatly accelerated the pace of our launch. Oxion™ is one of the most practical innovations in antenna technology."

Wang Dongli
Head of R&D
Berry Electronic Technology

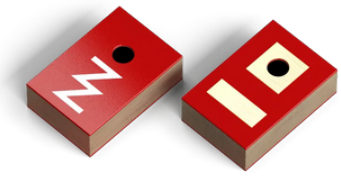
THE SOLUTION

A collaborative approach to solving connectivity

From this first decision, a close collaboration began. Ignion's engineering team stepped in to help turn ambition into practical design, becoming an extension of Berry® R&D effort.

They began by selecting the NANO mXTEND™ antenna booster (NN02-101), a component barely the size of a grain of rice (3.0 x 2.0 x 0.8 mm) but engineered to deliver consistent Bluetooth® performance across the 2400–2500 MHz ISM band. This tiny antenna provided the miniaturized integration Berry® needed, sliding seamlessly into the wearable's dense layout without forcing any compromises on device size or aesthetics. Its ultra-compact footprint was essential to achieve Berry's target form factor without enlarging the product casing.

But simply installing the antenna wouldn't be enough. The battery's proximity risked interfering with the signal, and maintaining power efficiency was critical to achieve Berry's target lifespan for the device on rechargeable lithium batteries.



NANO mXTEND™
(NN02-101)

Operating range	2400 - 2500 MHz ISM
Dimensions	3.0 x 2.0 x 0.8 mm
Best for	Bluetooth®

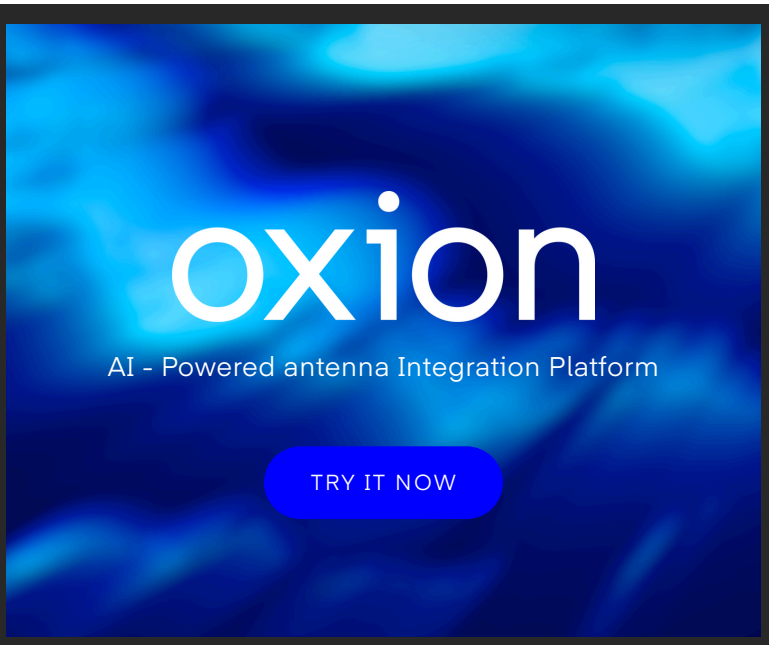
Through a full design review and precise antenna placement guidance, Ignion's specialists mapped out how to protect signal quality despite the crowded PCB. They developed a customized matching network, tuning the impedance with carefully selected inductors and capacitors to align power delivery and optimize performance. This configuration eliminated the Bluetooth® instability initially caused by the lithium battery's close proximity.

Throughout this process, return loss tuning and performance validation ensured that the antenna's efficiency benchmarks held steady under real-world conditions. Even with continuous use, the final design delivered remarkable power efficiency.

Berry was able to move quickly with the help of Oxion™, Ignion's AI antenna integration platform and hands-on engineering services that accelerated every phase from simulation to tuning to certification achieving simplified development and a faster path to market. The final design also supported global certification requirements.

In the end, the BM2000's strong signal quality and compact form factor weren't just theoretical goals. They became reality, thanks to a partnership that blended advanced antenna technology with collaborative problem-solving.

Want to cut development time and streamline certification?

Oxion™ makes antenna integration faster and smarter

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