ignion

Protect Connect

HEALTHCARE

Achieving Long-Range Connectivity in an Ultra-Compact mPERS

How Eview GPS Delivered Reliable GNSS and LoRa Performance in a Wearable Device with Ignion's Antenna Technology

Shenzhen Eview GPS Technology Co. Ltd., a leading provider of GPS positioning solutions, developed the **EV-12 mPERS pendant**. This lightweight Mobile Personal Emergency Response System (mPERS) lets elderly users press a button to trigger an SOS alert, sending real-time location updates to caregivers indoors and outdoors, in a form factor small enough for comfortable daily wear.

THE RESULTS

Multi-Band Antenna Integration in a 53 × 30 mm PCB
Miniature DUO mXTEND™ and ONE mXTEND™ antennas combined GNSS and LoRa performance in an ultra-compact design, with proper isolation to reduce interference.

Simplified Assembly with IP67 Protection
Eliminated external antennas to maintain full IP67 sealing while reducing production complexity.

Extended Battery Life for Outdoor Safety
Optimized matching network reduced power consumption, enabling longer operation between charges, critical for outdoor safety applications.

Seamless Global Deployment
Multi-band compliance across Europe, United States and Australia bands without the need for hardware redesign.

THE CHALLENGE

Eview GPS Pursuit of Miniaturized, Long-Range Connectivity

With more than ten years of experience in satellite positioning systems, Eview GPS has built a reputation for creating reliable safety and tracking solutions.

Developing the EV-12 pendant pushed this reputation further, challenging the team to rethink what was possible in mobile emergency devices.

Creating a fully featured mPERS solution in such a small form factor meant **overcoming several interrelated hurdles**: achieving consistent connectivity, preventing interference among densely packed components, and maintaining power efficiency. All without sacrificing regional compliance or ease of manufacturing.

The EV-12 project set a new bar: designing a fully sealed personal emergency pendant weighing only 43 grams, but still capable of:

- Optimizing power efficiency to maximize battery life in demanding outdoor use.
- Supporting multiple regional frequency bands to streamline global distribution.
- Delivering stable GNSS and LoRa connectivity for continuous tracking and communication.
- Fitting multiple radios into a 53 × 30 mm PCB without interference from batteries, casing, or other components.

"Its flexible multi-band support covers the mainstream frequency bands in Europe, the US, and Australia, allowing us to **quickly adapt to network requirements in different regions** without changing antennas. This greatly improved the efficiency and compatibility of our global deployments."

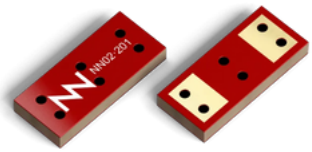
Flynn Deng
Product Manager
Eview GPS

THE SOLUTION

A Collaborative Approach to Seamless Multi-Band Performance

From the outset, Eview GPS worked side by side with Ignion to define how advanced connectivity could fit into the EV-12's compact form factor. Ignion recommended a dual-antenna configuration, combining the DUO mXTEND™ for GNSS reception and the ONE mXTEND™ for LoRa connectivity. Together, these miniature components enabled the pendant to **maintain accurate satellite positioning and long-range communication** in a single, fully sealed device.

Beyond size constraints, the solution had to support consistent performance across different regions without requiring separate hardware versions. This flexibility meant Eview GPS could offer a product ready for deployment in Europe, North America, and Australia. In addition to component selection, the team also recommended **Low Noise Amplifier (LNA) strategies** to strengthen GNSS signal reception without increasing the footprint. In addition, the Ignion team reviewed Gerber files prior to prototyping, ensuring a smooth handoff to production and improving the likelihood of first-pass success. By integrating Ignion's Antenna technology directly into the PCB layout, the team **eliminated the need for external antennas and preserved the sleek**, lightweight design essential for a wearable safety device. This foundational approach set the stage for the next phase: optimizing placement, fine-tuning performance, and validating every aspect of the design to ensure reliable connectivity in real-world conditions.



ONE mXTEND™
(NN02-201)

DUO mXTEND™
(NN03-320)

Operating range	863 - 870 MHz (EU) 900 - 912 MHz (AU) 902 - 925 MHz (US)	1558 - 1610 MHz
Dimensions	7.0 x 3.0 x 1.0 mm	7.0 x 3.0 x 2.0 mm
Best for	LoRa	GNSS

Through a full design review and careful antenna placement guidance, Ignion's specialists mapped out **how to maintain consistent signal quality despite the dense integration** of GNSS, LoRa, and other radios on the compact PCB. They developed a customized matching network, fine-tuning impedance with precisely selected inductors and capacitors to align power delivery and preserve multiband performance.

Throughout this process, efficiency validation confirmed that the design demonstrated **GNSS radiation efficiency exceeding 50%** and achieved excellent impedance matching, with **VSWR consistently below 2** in final validation.

Even with continuous outdoor use, the final configuration achieved outstanding power efficiency, extending the time between charges and delivering reliable long-range communication that users can depend on.

And because Eview GPS needed to move quickly, Ignion's support went far beyond design with dedicated engineering expertise, the team accelerated every stage. This flexibility also simplified inventory management by **eliminating the need for multiple hardware SKUs** across regions.

This engineering collaboration ensured the EV-12 achieved reliable GNSS reception in diverse environments, reducing development cycles and enabling faster time to market.

Accelerate development and ensure global readiness

Ignion's experts help you integrate antennas seamlessly.

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