



Helping to save lives with a soldier tracking device.

CASE STUDY

Summary

This U.S. defense company needed to quickly develop a soldier tracking system resembling a highly precise wrist-worn GPS. Our electrical and software engineers implemented Beacon EmbeddedWorks SOMs to ensure the product would meet the durability and reliability thresholds. The device was deployed to the battlefield on time by utilizing our complete product lifecycle management and manufacturing services.

Challenge

For many years, communicating with soldiers in the field was difficult and sometimes impossible. Troops relied on written communication that took days or weeks to arrive. Today, with the expanding capabilities of personal technology devices and computers, real-time communication is possible. This instant communication has become crucial to soldiers in the field who depend on up-to-date tactical and mission-critical information. Growing military intelligence has made combat more strategic and even more dangerous, making it increasingly important to provide our troops with the most advanced communication devices available. However, the success of these types of products has been limited due to pronounced need for devices to be reliable, durable, compact in size, and light weight.

Customer Profile

The customer, a market leader in intelligence, surveillance, and reconnaissance systems, creates products that provide reliable and tactical information to defense and security personnel around the world.

More Information

Why choose a Beacon EmbeddedWorks SOM?

See what differentiates our SOMs from the rest.

beaconembedded.com/system-on-modules/

About Beacon EmbeddedWorks

Beacon EmbeddedWorks is a full-service provider of innovative System on Modules (SOMs). Backed by a suite of customization, security, and support services, our dependable, pre-certified, and feature-dense embedded solutions serve the most strenuous applications.

Challenge Continued

The customer developed a set of high-level product requirements with the goal of delivering a small, wearable communication device to the hands of soldiers quickly. The company commissioned Beacon's team of experts to collaborate on the complete product lifecycle of the device.

Solution

By leveraging Beacon's design and engineering skills, the customer sought to improve situational awareness and communication in the field with tactical networks. This new technology would combine GPS and communication software to visually track soldiers working remotely. In order to create an impact in the marketplace, end user adoption would be critical. Several considerations needed to be made to ensure that soldiers would not only feel comfortable using this technology, but learn to rely on it.

Size and weight were the biggest restrictions to the device as soldiers already carry cumbersome gear that typically weighing 60 to 100 pounds. The customer did not want the wearable device to inflict additional burden. To design the most compact device possible, our design team recommended a System on Module (SOM) for processing. At less than one square inch, the SOM would eliminate excess size and weight. Beacon EmbeddedWorks' SOMs also provide the advantage of being interchangeable. Thus when an updated version becomes available the SOM and can be easily removed and replaced to continuously improve the technology and functionality of the device.

Upon conducting a thorough review of the device's functionality our teams uncovered other limitations to end user adoption, including radiation interference, temperature constraints, and battery power.

Power and battery life also needed to be considered when evaluating end user adoption. Since these devices would be used remotely, they would not be charged regularly. Therefore, the device had to be designed with enough internal battery life to sustain power for long periods of time. This challenge was exacerbated by the compact design of the device, dictating small battery size. To overcome this, we utilized smart reflex technology. This software design style stops power flow to parts of the board not being used. Smart reflex technology can quickly ramp up and down depending on the needs of the user, enabling substantially extended battery life.



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Solution Continued

Given that the central function of the device is to monitor troop movement throughout remote territories, integrating GPS technology was critical. Due to the possibility of unreliable GPS signals in remote locations, a compass and an accelerometer were also included to provide accuracy in output reporting. The compass and accelerometer combination allows soldiers to project their location on-screen to help them stay on track until they regain GPS control. A glass display was used to visually show soldiers where troops are located and how they are moving using icons.

Results

The Beacon EmbeddedWorks manufacturing team produced over 1,000 of the new devices that were delivered to deployed soldiers in the battlefield for immediate use. Weighing less than 10 ounces each, soldiers are able to carry or wear the device on their arm. The screen was positioned to be visible whether held or worn, allowing soldiers to interact with the map, view their location, and monitor surrounding areas. During the concept and prototyping stage, the devices were tested to withstand impact, dust, water, vibration and temperature exposure to ensure reliability in the field. Soldiers favor the device because it provides improved situational awareness and connects them to tactical networks that provide mission-critical information. The customer has since begun expanding this technology to other applications that can benefit from the transfer of reliable and quick information including public safety officials and first responders.

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