LANTRONIX®

INDUSTRY: Security and Smart Cities

Lantronix Helps Bring Military-Grade Gunshot Detection System to Market

Success Highlights

- Accelerate time-to-market
- Offer a cost-effective solution
- Ensure military-grade reliability
- Enable cutting-edge 5G connectivity
- Deliver a scalable edge processing platform
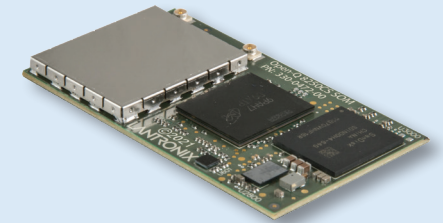- Provide sub-second real-time detection

Case Study Overview

Utilizing Lantronix's Open-Q™ 8250CS SOM (System on Module), based on Qualcomm® QCS8250 System-on-Chip, and Lantronix's Engineering Services, GWACS Defense Inc. of Tulsa, Okla., adapted its military-grade gunshot and noise detection system for the commercial market, integrating advanced acoustic technology into an innovative solution for public safety.

Challenge: Adapt a Military-Grade Solution for Commercial Use

Among the challenges GWACS Defense faced when adapting its Acoustic Event of Interest (AEI) system for the commercial market were:

1. **High-Resolution Acoustic Sampling:** Achieving the precise detection required for meaningful event classification while maintaining reliability in diverse environments.
2. **Optimization of Snapdragon SOM:** Maximizing GPU and DSP capabilities to implement real-time AI algorithms for mission-critical applications.
3. **Reliable, High-Speed Connectivity:** Ensuring secure and robust communication options, including real-time alerts and cloud data integration.
4. **Commercially Available Solution:** Converted military- proven solution to a commercial-ready platform.

Lantronix Open-Q™ 8250CS SOM

The Open-Q™ 8250CS production-ready computing SOM delivered with Android™ 13 provides a power platform for edge computing.

- Powerful specialized processing cores
- On-device Qualcomm® AI Engine™ (15 TOPS) for machine vision, neural networks, deep learning workloads at low power
- Powerful image signal processor for up to 24 video streaming cameras
- 8K video encode/decode, up to 64MP photo and video capture
- WiFi 6, Bluetooth Low Energy v5.1

For more information, visit: https://www.lantronix.com/products/open-q-8250cs-som/

> " The successful development of our gunshot detection solution exemplifies the powerful collaboration between GWACS Defense, Lantronix and Qualcomm, setting a new standard in acoustic detection, connectivity and public safety technology. "
>
> – Jud Gudgel
> Chief Executive Officer
> GWACS Defense Inc.

SOLUTION: Open-Q™ 8250CS SOM

Lantronix's Open-Q™ 8250CS SOM provided a defense-grade, production-ready SOM with robust firmware support, which enabled GWACS Defense to adapt its military-grade gunshot detection system for the commercial market. This collaboration enabled:

- Seamless integration of AI and DSP algorithms for real-time acoustic detection detection of edge devices;

- Machine learning, enabling the classifier to continuously improve detection accuracy for various weapon types and environmental sounds;

- Streamlined development with engineering services that minimized technical risk; and

- Advanced connectivity options, including Qualcomm's 5G capabilities for ultra-fast, low-latency communications, ensuring real-time alerts and secure cloud integration.

> **" In partnership with Lantronix, for the first time, GWACS is bringing advanced military-grade technology to the commercial market at a price that is both competitive and compelling. "**
>
> – Shel Jones
> US Army LTC Retired
> Vice President, Business Development
> GWACS Defense Inc.

RESULTS: A Powerful Platform for Gunshot Detection

Designed for deployment in schools, public spaces and other high-risk venues, the GWACS AEI system is a cutting-edge acoustic system designed for rapid detection and classification of gunshots and other events of interest including drone detection and tracking.

Leveraging Qualcomm's Snapdragon SOM and engineering expertise from Lantronix, GWACS created a solution that delivers unmatched precision, connectivity and affordability. Benefits of the collaboration include:

- Accelerated time-to-market for the AEI system, with a prototype ready in record time

- Cost-effective solution that maintains military-grade reliability

- Scalable edge processing platform capable of adapting to diverse applications, from active shooter detection to integration with existing security systems

- Cutting-edge 5G compatibility connectivity, empowering high-speed data transfer for mission-critical operations

About the GWACS AEI System

The GWACS AEI system achieves a detection rate of over 99 percent within a 600-meter radius and boasts an unprecedented rejection rate for false positives, validated through rigorous military and law enforcement testing. Key features include:

- **Superior Sampling**: 24-bit ADC sampling at 192 kHz, covering frequencies from 20 Hz to 96 kHz.

- **Real-Time AI Processing**: Hardware-accelerated algorithms for rapid classification of events.

- **Power Efficiency**: Optimized power usage, including options for PoE, solar and 12V setups.

- **Versatile Connectivity**: Ethernet and Wi-Fi 2.4 GHz for local integration.

Lantronix Engineering Services

Lantronix's unparalleled engineering expertise and product development provide its customers with best practices to cost-effectively deliver high quality, innovative products

About Lantronix

Lantronix Inc. is a global leader of compute and connectivity IoT solutions that target high-growth industries including Smart Cities, Automotive and Enterprise. Lantronix's products and services empower companies to succeed in the growing IoT markets by delivering customizable solutions that address each layer of the IoT Stack.

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