LANTRONIX®

INDUSTRY:

Industrial Wearables

Guardhat Named Among TIME's Best Inventions of 2020

Success Highlights:

- Provide an affordable, secure, remote communication solution in a smart hardhat
- Contribute to the design solution to help contain development costs
- Integrate cameras and adapt camera tuning for improved image quality
- Assist with electrical design customization and validation for safety regulations
- Utilize audio expertise to overcome challenging industrial environments

Case Study Overview:

The innovative founders of Guardhat re-envisioned the hardhat into a smart communicating device that would monitor the wearer's location in real time; allow them to make hands-free video and audio calls; and detect their proximity to hazardous materials, temperatures and moving equipment. To make the hardhat a communicating device, the design incorporated sensors, a camera and microphones with the on-device processing power of the Lantronix Open-Q™ 626 µSOM (micro System on Module) based on the Qualcomm® APQ8053-Pro SoC (System on Chip). The result is the Guardhat HC1 Communicator smart hardhat that enables remote monitoring of and communication with the user.

> **"The Guardhat HC1 Communicator shares information about the worker's location with the home base while comprehensive communications options enable voice and video calls."**
>
> – Anupam Sengupta, CTO and Co-founder, Guardhat Inc.

Protecting the Lives of Industrial Workers

Safety first is the key goal of industrial operations management. Whether on an oil rig, at the bottom of a mine, next to a blast furnace or atop an electrical tower, workers must be tethered to central operations. To help ensure the safety of industrial workers, Lantronix assisted Guardhat with modifying the electrical and software design to align with requirements for safety-critical environments. Lantronix performed full validations of the power system modifications required.

Challenge: Deliver Globally Certified Connectivity

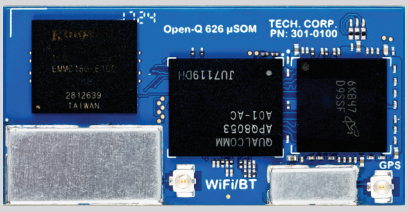
The Guardhat team turned to Lantronix and its Intelligent Edge Solutions team to tackle a big design challenge: add all the features and functions

Product:
Lantronix Open-Q 626 µSOM

The Lantronix Open-Q 626 production-ready µSOM (Micro System on Module) is based on the Qualcomm® APQ8053-Pro SoC processor.

Product Compatibility

- Bluetooth® and Wi-Fi® connectivity
- Octa-Core 64-bit ARM®
- Cortex® A53
- Adreno™ 506 GPU
- Hexagon™ 546 DSP
- Dimensions 25mm x 50mm
- Android™ 9 & 10



For more information:
https://www.lantronix.com/products/open-q-626-usom/

they wanted without making the hardhat too heavy or cumbersome for the workers to wear. Challenges included:

- Incorporating sensors, a camera and microphones into the hardhat
- Tying them together with necessary on-device processing power
- Enabling wireless connectivity for remote communication
- Ensuring secure boot, wireless communication and secure updates
- Delivering quickly to improve the time to development and market

Solution: Lantronix Open-Q 626 µSOM and Development Kit

The Guardhat designers chose the Lantronix Open-Q 626 µSOM, which is based on the APQ8053-Pro, to deliver the ideal balance of advanced processing capabilities and power efficiency.

With the support of the Lantronix team, Guardhat built several technologies into the hardhat:

- **Android Operating System** — The OS was customized to include support for USB, serial port, SD card, Near Field Communication (NFC), Wi-Fi, GPS and specific Bluetooth low-energy profiles.
- **Camera** — Lantronix assisted with integration and image quality tuning of the image signal processor (ISP) in the APQ8053-Pro for the 13MP camera.
- **Audio** — Lantronix helped incorporate support for stereo microphones and Qualcomm® noise and echo cancellation to suppress noise in loud industrial environments.
- **Secure boot and software update** — Lantronix enabled Qualcomm Secure Boot to ensure software integrity and over-the-air updates for secure remote software installation.
- **Wireless** — NFC, RFID, Wi-Fi and Bluetooth capabilities are integrated into the hardhat

> **"Utilizing the Lantronix team's knowledge and unique micro SOM technology, Guardhat's innovators were able to reinvent the hardhat, making it a communicating device that helps keep workers safely in touch."**
>
> – Victor Gonzalez, Senior Director, Engineering, Lantronix Inc.

Results: Guardhat HC1 Communicator Smart Hardhat Connects Remote Workers

The Guardhat HC1 Communicator smart hardhat monitors the workers' environments, sending warnings and alerts in case of imminent danger, and applies wearable technology to overcome hazardous conditions. It enables remote communication, including audio and video calls and the ability for the user to push a single button for help. It also provides a real-time decision-making and data analytics platform that connects industrial workforces through situational awareness.

Benefits Include:

- Quickly build a market-ready prototype
- Reduce total cost of development
- Get to production and market faster
- Deliver a comprehensive, globally certified solution to market

Lantronix Open-Q 626 µSOM Development Kit

Lantronix's Open-Q™ 626 µSOM Development Kit is a cost-effective, feature-rich, camera-tuned, exposed board platform powered by the Open-Q 626 production-ready µSOM, based on the APQ8053Pro processor. The development kit is ideal for evaluation of the Open-Q™ 626 µSOM as well as quick development of connected camera devices or other high-performance embedded products.

About Lantronix

Lantronix, Inc. is a global provider of hardware and software solutions for the Internet of Things (IoT) and Out-of-Band Management (OOBM). Lantronix's solutions are deployed inside millions of machines at data centers, offices, and remote sites serving a wide range of industries, including energy, agriculture, medical, security, manufacturing, distribution, transportation, retail, financial, environmental, and government.

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