



Case Study

Infrared Detector for Infrastructure Security

Safeguarding the Infrastructure to Secure a Normal Daily Life

Infrastructure, including power plants, government buildings, and subway stations, is a critical focal point requiring robust security measures to mitigate risks such as sabotage, protests, civil unrest, or theft. Disruptions to these essential services can significantly impact daily life. Implementing cost-effective solutions like infrared detectors can enhance the efficiency of security personnel, ensuring the continued smooth operation of vital infrastructure.

Challenges

The customer is a professional system integration company that provides customized hardware solutions for security, industrial, telecommunications, and semiconductor industries. It was looking for a 13th gen Intel® Core™ i7 COM Express Basic Type 6 module compatible with VxWorks, a real-time operating system (RTOS), for its infrared detection systems. It needs to detect fast-approaching threats, so the low latency between system communications is the most important consideration. To maintain stable and safe operation, this industrial-grade module is expected to support the Trusted Platform Module (TPM) and watchdog timer functions. It also requires customized BIOS to support VxWorks.

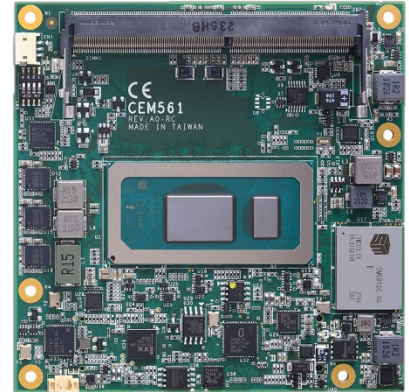
Main Requirements

- 13th gen Intel® Core™ i7 processor
- Supports Trusted Platform Module (TPM) 2.0 and watchdog timer functions
- Customized BIOS for VxWorks operating system
- Long product life cycle

The High-Performance Module Meets the Demand for High-Level Security

Axiomtek has proposed its CEM561, a COM Express Type 6 Basic module powered by the 13th & 12th Gen Intel® Core™ Processors (U Series). It supports two DDR4-3200 memory for up to 64GB. Its

wide operating temperature range of -40°C to 85°C is perfect for the harsh combat field. Two SATA-Gen 3 and NVMe up to 512GB are available for enhancing storage reliability and capacity. This industrial module also comes with computer expansion standards, including one 1 x PCIe x4 Gen + 5 x PCIe Gen3. As the module is installed on the customer's own carrier board, Axiomtek has simulated the same environment to adjust BIOS, which greatly shortens the development time. What's more, it supports other interfaces such as LPC, SPI, TX/RX, and I2C. Attributable to Axiomtek's customization experience, the small form factor platform has been used in rugged PC or aerospace use cases as well.



Application

The Infrared Detectors Enhance the Defense of Infrastructure



The customer has utilized Axiomtek's CEM561 to build its infrared detectors. To meet the demands, the CEM561 provides a solid platform and can seamlessly integrate with existing security systems, enabling real-time alerts and remote monitoring. As the key part of the detectors, this module is

responsible for processing the detection and tracking. After detecting the unknown targets, it will start the alert.

Choosing the COM Express Type 6 Basic module has several advantages; the end user can select the carrier board with different specs according to various demands and use scenarios. When the system needs to be upgraded, the user only needs to replace the module. The hardware upgrade is fast and easy.

System Configurations of the CEM561

- 13th/12th gen Intel® Core™ i7/i5/i3 or Celeron® processor (Raptor Lake U / Alder Lake U)
- Dual channel DDR4-3200 SO-DIMM for up to 64GB
- Up to 12 lanes of PCI Express
- 2 SATA Gen3
- 4 USB 3.0 and 8 USB 2.0
- Supports NVMe for up to 512GB
- Supports TPM 2.0

Why Axiomtek

Axiomtek not only provides reliable and various products, with abundant experience in IPC, but complete and organized customization and service procedures were also established to meet customers' demands and help customers complete the applications.

“We are committed to providing customers with quick-reaction solutions; however, the BIOS adjustment and customization, in this case, were estimated to require lots of time, which will affect the whole project schedule. Thanks to Axiomtek’s quick service and professional communication, the hardware development in this project was completed on schedule and went beyond our expectations,” said the engineering manager of the customer.

About Axiomtek Co., Ltd.

Axiomtek has experienced extraordinary growth in the past 30 years because of our people, our years of learning which resulted in our tremendous industry experience, and our desire to deliver well-rounded, easy-to-integrate solutions to our customers. These factors have influenced us to invest in a growing team of engineers including software, hardware, firmware, and application engineers. For the next few decades, our success will be determined by our ability to lead with unique technologies for AIoT and serve our key markets with innovatively-designed solution packages of hardware and software – coupled with unmatched engineering and value-added services that will help lessen the challenges faced by our systems integrator, OEM and ODM customers and prospects alike. We will continue to enlist more technology partners and increase collaborations with our growing ecosystem who are leaders in their fields. With such alliances, we will create synergy and better deliver solutions, value, and the expertise our customers need.

Axiomtek is a Member of the Intel IoT® Solutions Alliance. A global ecosystem of more than 800 industry leaders, the Alliance offers its members unique access to Intel technology, expertise, and go-to-market support—accelerating the deployment of best-in-class solutions.