Tech for **Tough Tasks**

AAEON.COM ↗ | Talk to Our Experts

From the excessive heat of remote desert worksites to the shock and vibration of in-vehicle deployment, discover how AAEON's rugged computing platforms are tailored to withstand even the most demanding environmental stresses, all while maintaining peak operation.

AAEON

The Building Blocks of Rugged Computing

Engineering Resilience

For AAEON, building platforms capable of thriving in harsh environments is about more than hardware, it is about drawing over 30 years of experience addressing project needs to proactively anticipate potential application deployment pain points.

While AAEON enforces rigorous quality testing across its product portfolio, some setups require a custom approach to guarantee long-term stability and operational success. It is in this area that AAEON's agile approach and flexible customization capabilities provide an advantage, allowing us to build both standard and fully customized platforms capable of lasting the test of time.

From undertaking certifications required to ensure customers remain compliant with industry-specific safety regulations to implementing design principles that aim to extend product life cycles, AAEON's goal is to help bring applications to fruition, regardless of where they are deployed.

Thermal Management
Custom heatsinks and fanless designs handle extreme temperatures

Shock & Vibration
MIL-STD-810G testing ensures reliability in motion

Environmental Sealing
IP65 ratings protect against dust and water ingress

Power Stability
Wide DC input ranges handle volatile power sources

Table of **Contents**

AAEON's Mission

Headquarters

Manufacturing/Logistics Centers

For over three decades, AAEON has been at the forefront of industrial computing innovation, designing and manufacturing embedded systems that refuse to compromise. Our mission is simple but unwavering: to deliver computing solutions that work flawlessly in environments where failure is not an option.

The stability of critical systems operating in harsh environments is not only essential for operational continuity but also crucial for protecting worker safety and maintaining customer trust. For this reason, AAEON conducts rigorous product quality testing to ensure dependable performance under demanding conditions. AAEON also recognizes that embedded systems are not one-size-fits-all solutions. Customers can therefore work with confidence knowing that AAEON has the expertise and experience to customize platforms to meet the specific requirements of their applications.

Awards & Recognitions

2026

Recognized globally for innovation, sustainability, and engineering excellence.

Taiwan Excellence Award

2025

| Talent Sustainability Award | EcoVadis Bronze Medal | Corporate Sustainability Awards | Linking Corporate Humanities Awards | Taiwan Excellence Award | Best Choice Award Gold Award |

2024

| Talent Sustainability Award | The New Taipei Enterprise Classic Awards | Taiwan Institute for Sustainable Energy | Linking Corporate Humanities Awards | Best Taiwan Global Brands Rising Star Award | Excellence in Corporate Social Responsibility |

Where Rugged Computing is Essential

ENVIRONMENTS

01 Heavy Industry

Extreme temperature fluctuations, dust and debris, and the need for continuous operation place additional stress on embedded systems. As such, robust hardware is needed for physically demanding environments such as factories, construction sites, and energy plants.

02 Field Operations

Field-deployed devices must balance reliability with portability while being exposed to rain, snow, wind, and direct sunlight. Rugged systems face drops, as well as the challenges of limited or intermittent battery and power supply to operate in remote, outdoor settings.

03 Transportation

Whether deployed within vehicles or as part of transport infrastructure, embedded systems encounter consistently high levels of vibration and shock. Because of this, rugged systems are needed to maintain reliability in dynamic, mobile, and high-stress environments.

Real-World Deployments

Heavy Industry AI Safety Monitoring

Desert deployment with sustained 50°C operation

Field Equipment Health Monitoring

Portable leak detection for industrial equipment

Train Passenger Information System

Onboard Displays on moving vehicles

In-Vehicle Security System

Mobile surveillance with PoE camera support

Heavy Industry AI Safety Monitoring

A company deployed an AI-driven safety monitoring system at worksites across Asia and the Middle East. As well as addressing a broad range of risk areas, AAEON's customization allowed their system to maintain high performance operation in the desert, with outdoor temperatures exceeding 122°F (50°C) over sustained periods .
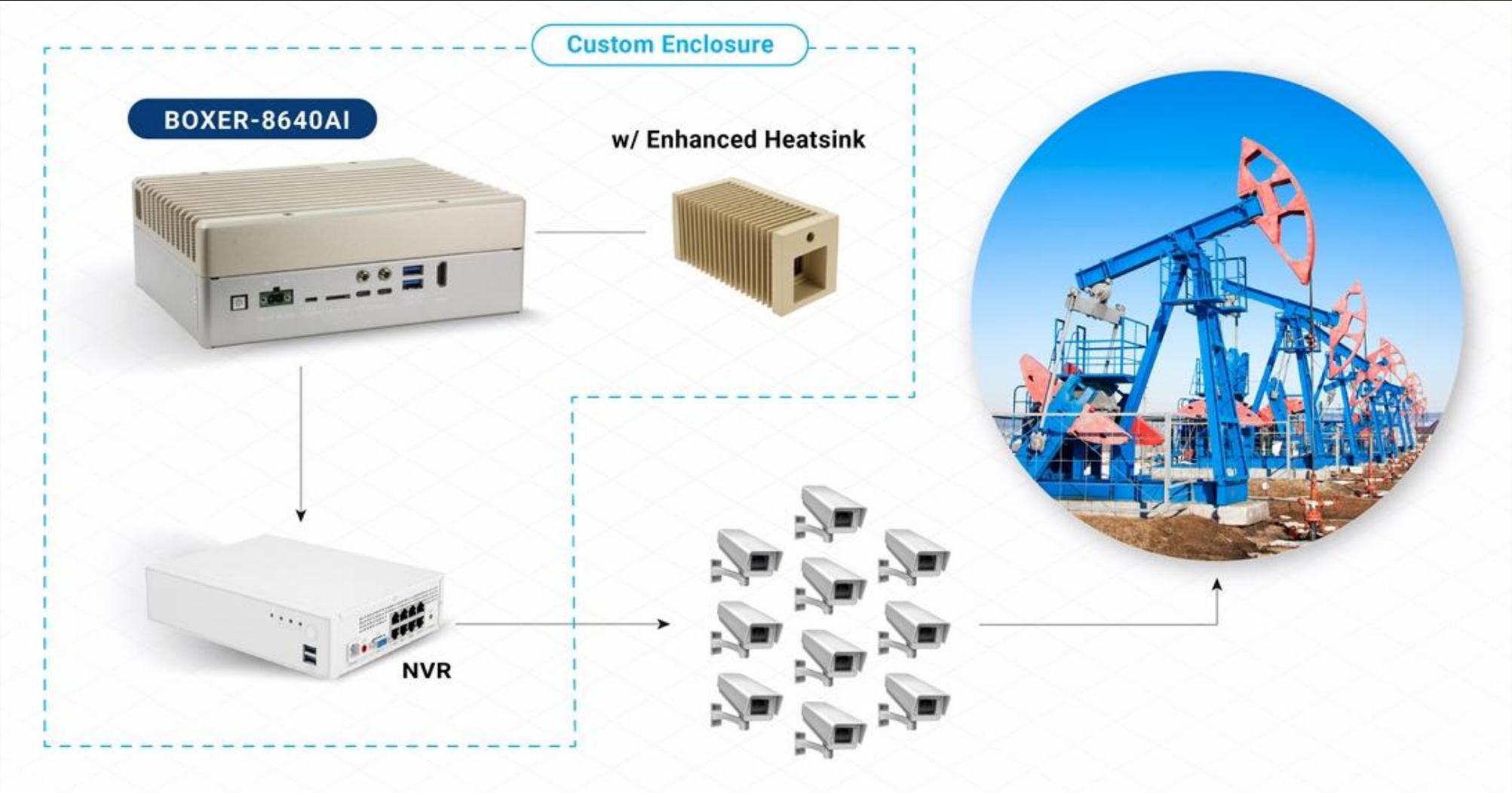
Key Challenge 1

Continuous outdoor operation while running heavy inference models had caused heat failure in other systems.

Key Challenge 2

The presence of sand and other fine particles on worksites presented a threat to the hardware, potentially causing build-up and preventing the PC from effectively dissipating heat.
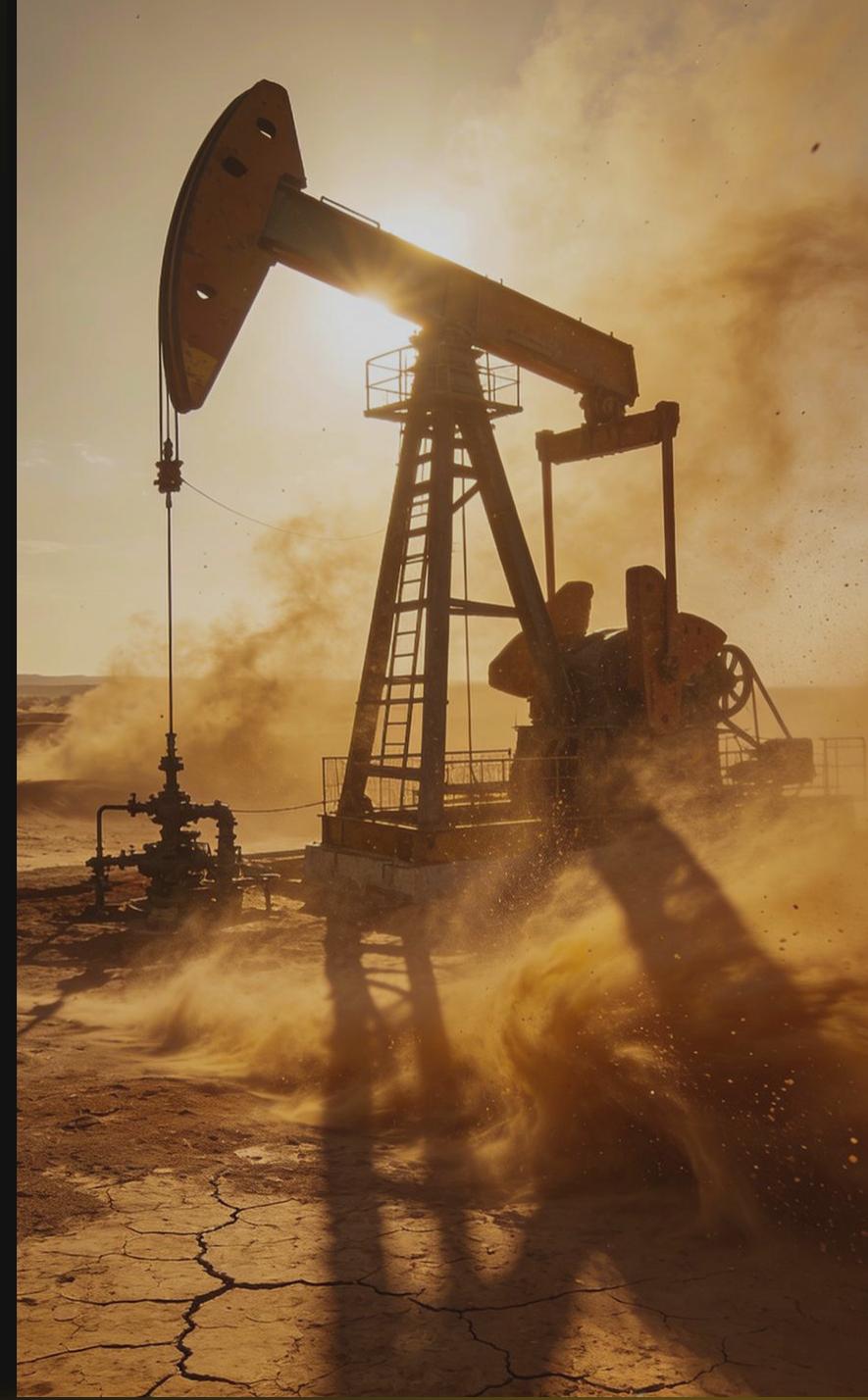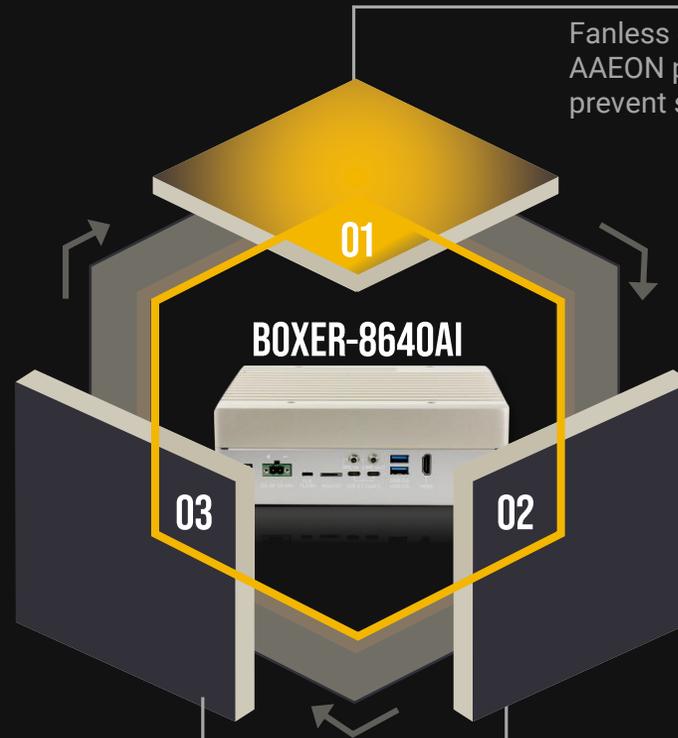
Why AAEON's BOXER-8640AI?

Fanless Design with Customized Enclosure

Fanless operation was vital for desert deployment. AAEON provided a fully sealed enclosure to prevent sand and fine-particle ingress.

01

BOXER-8640AI

03

02

Deployment-Ready

AAEON provided a custom OS image with all AI models preinstalled and configured for immediate use, reducing setup complexity.

Custom-Built Heatsink

AAEON designed and installed an enhanced heatsink to prevent heat failure, allowing complex AI models to run at full capacity in 50°C+ temperatures.

Field Equipment Health Monitoring

A global leader in vacuum technology leveraged the RTC-710RK as a rugged, wireless remote controller in an upgrade to its portable leak detection systems, used to monitor the fortitude of system components in industries such as automotive manufacturing, semiconductor, and HVAC.

Key Challenge 1

The unit was portable, carried by technicians and used both inside and outdoors. As such, physical damage from the tablet being dropped and from water ingress were both concerns.
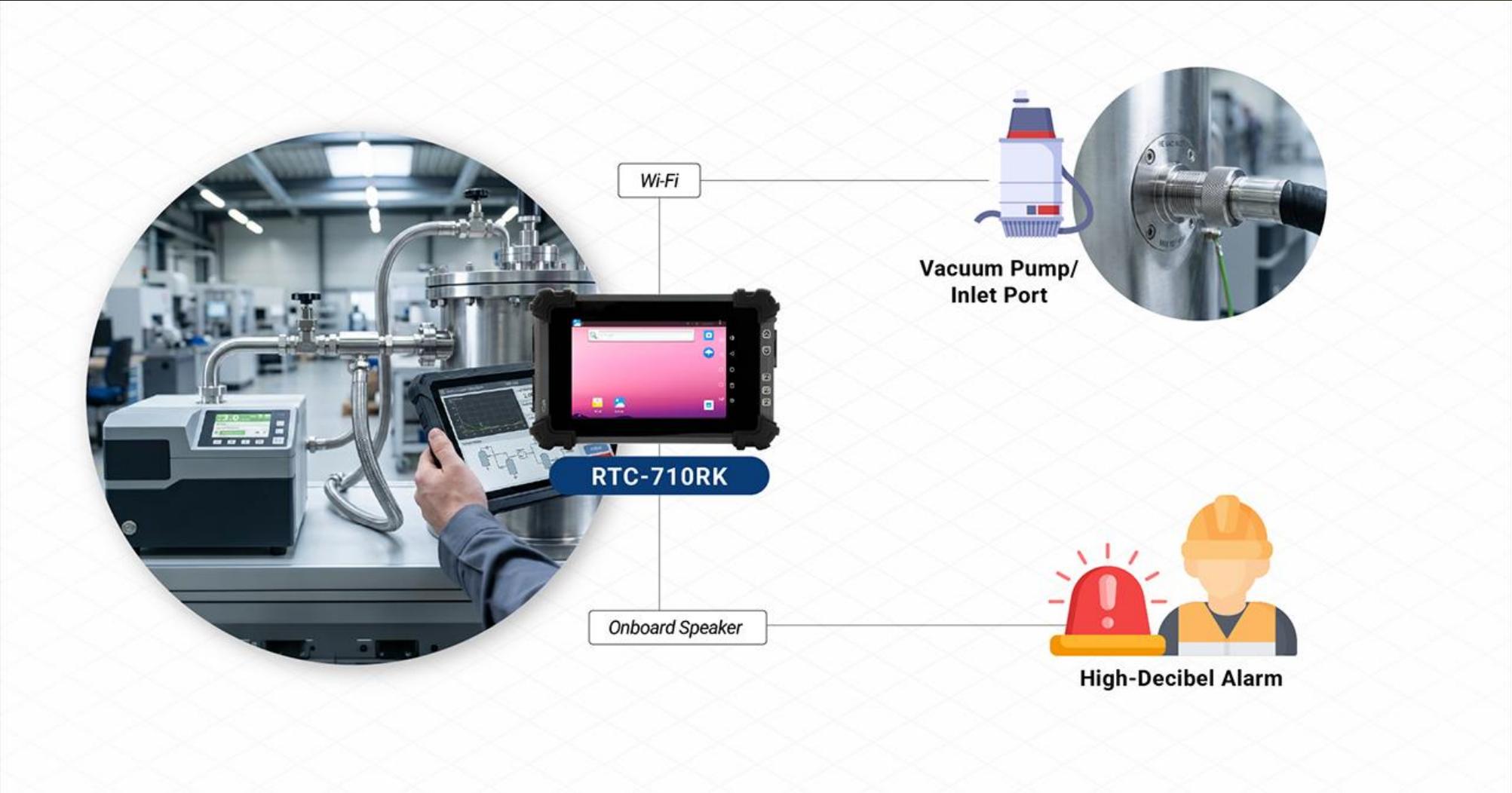
Key Challenge 2

On-site testing tools often operate near heavy machinery. As such, standard computing systems would not be able to tolerate the high levels of vibration such environments exposed them to.

Application Architecture

Wi-Fi

Vacuum Pump/
Inlet Port

RTC-710RK

Onboard Speaker

High-Decibel Alarm

Why AAEON's RTC-710RK?

VIEW PRODUCT ↗

Wide Temperature Tolerance

Designed to operate between −20°C to 60°C, allowing operation both outdoors and within industrial environments.

All-Weather Protection

IP65-rated, making it dust and water resistant, suitable for outdoor construction zones and remote inspection locations.

MIL-STD-810G Drop Tested

122cm (4 ft) drop resistance protected internal components from the impacts common with in-field equipment.

High-Visibility Daylight Display

7" multi-touch screen with 700-nit brightness to boost readability for both bright, outdoor and dark, indoor equipment inspection.

Extended Battery Life & Hot-Swappable Power

32.7W lithium-ion battery with 8-hours operation, plus an 11.3W hot-swappable backup for continuous use.
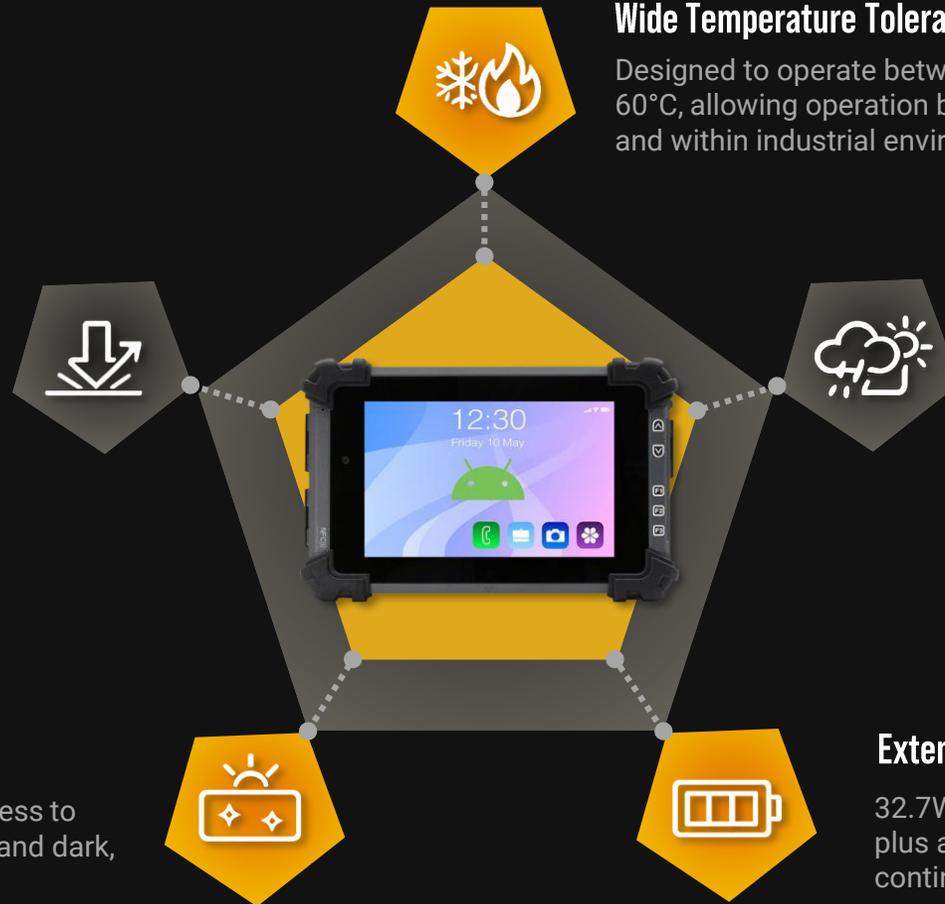
Train Passenger Information System

A leading company in the transportation field deployed AAEON's PICO-APL3 as part of a new passenger information system (PIS) for their fleet of trains, which serve to display key information such as the train's location, issue audio updates, and create revenue through advertisements.

Key Challenge 1

PIS boards can be exposed to low temperatures at depots and high heat during operation inside carriages, damaging components.

Key Challenge 2

Power sources are often volatile on vehicles, so the solution needed to cope with such irregular power fluctuations.

Key Challenge 3

Continuous vibration and occasional impact shocks can loosen or break components and modules.

Application Architecture

WiTAS 1

PICO-APL3

Time-synchronization

EtherCAT Slave Device

eDP, HDMI, DDI

BIOS Optimization

120W DC-DC Converter

9V ~ 36V Power Input

2W Amp Header

HD Audio

Why AAEON's PICO-APL3?

PICO-APL3

Fully Integrated Components

Compact Pico-ITX design with soldered CPU, eMMC, memory, eliminating component damage due to vibration.

DC-DC Converter

Prevents system resets or data corruption during transient power events through the inclusion of a 120W DC-DC converter, allowing for a 9V to 36V power input range .

Customized Extended Temperature Tolerance

AAEON provided project-based customization, redesigning the board to ensure it could tolerate a temperature range of -20°C to 70°C.

In-Vehicle Security System

A company that creates integrated security solutions wanted to enhance their in-vehicle security offerings. With AAEON's BOXER-8658AI, they successfully created a user-friendly, AI-supported, durable security solution to address their client's varied requirements.

Key Challenge 1

Security vehicles encounter ongoing vibration and sudden impacts during normal operation that can cause system components to break.

Key Challenge 2

Electrical systems face voltage spikes, dips, and transient power fluctuations, which can cause mechanical failure in embedded systems not designed to handle them.
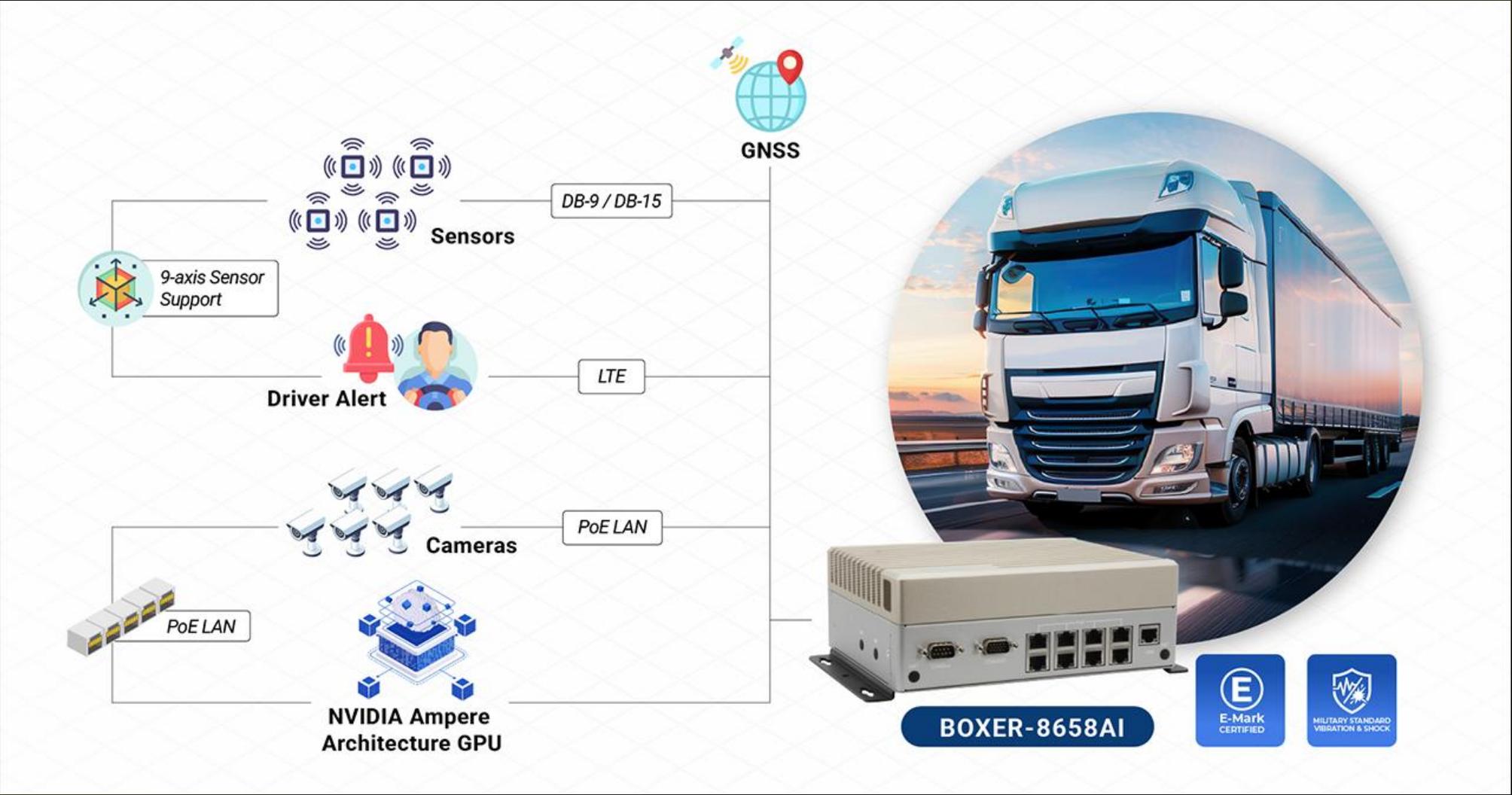
Key Challenge 3

Peripheral cameras often require a separate power supply, complicating installation.

Application Architecture

Why AAEON's BOXER-8658AI?

PLAY VIDEO ↗

Rugged, Fanless Design

MIL-STD-810G certification and fanless operation eliminates mechanical failure points.

Power Control

Wide 9–36V DC input with ACC ignition to align with the vehicle's ignition cycle.

PoE LAN

8 PoE LAN to support multiple cameras and eliminate the need for a separate power source.

E-Mark Certification

E-Mark certification to support deployment in road vehicles and transport infrastructure.

BOXER-8658AI

AAEON

Always Agile, Always Ahead.

With vast amounts of experience in successfully bringing rugged computing solutions to unforgiving environments, AAEON is ready for any challenge.

Toughen up your tech, today.

AAEON.COM ↗

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