

Secured Storage

Secured Software

Cloud Security

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# Improving Business and the World with AIoT

Innodisk worked with AIoT ecosystem partners and clients across industries to explore how intelligent integrated solutions make our smart future possible.

# A Connected Solution for Our Connected World

## ■ Introduction

Smart and connected devices are bringing staggering improvements to life, business, and everything in between. Today, you can find such devices everywhere—in factories, vehicles, homes, and remote locations like on wind turbines, solar power installations, and research stations.

Growing in numbers at an exponential pace and without geographic boundaries, we will soon be supported by these smart and connected devices wherever we go.

However, this smart future requires intelligent solutions. Otherwise, the costs and purely logistical challenges associated with managing and maintaining all these smart devices make this vision of the future completely untenable.

Fortunately, with the Innodisk InnoAGE SSD, our smart future remains within reach.

## ■ Key Figures



Part of annual revenue that the average small business spends on IT.



Share of IT costs incurred after the initial purchase.



Time the average employee spends attempting to fix device problems every week.

## ■ The Big Challenge

### IoT Connected Devices

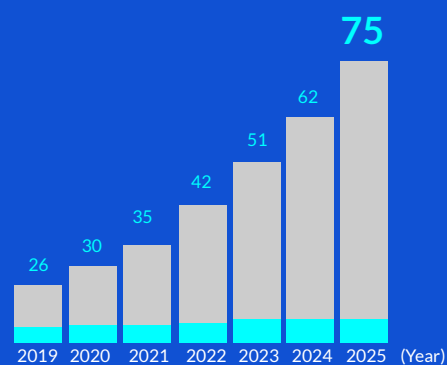


Devices



Operators

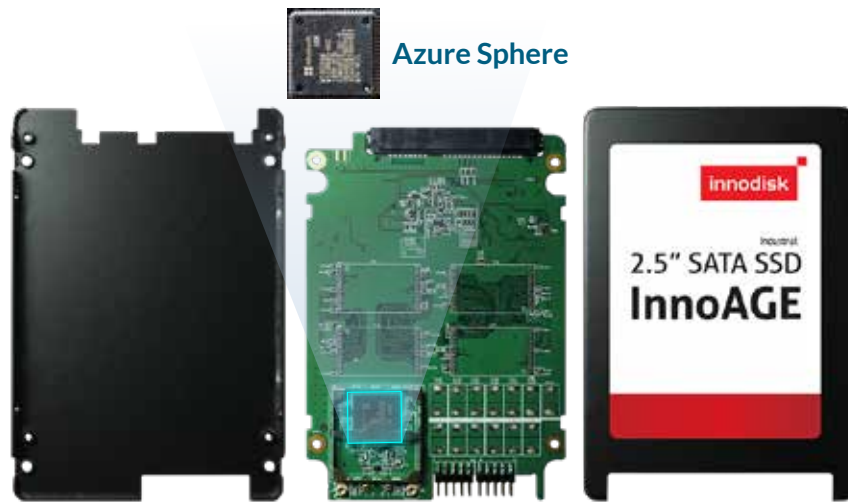
(in billions)



Edge computing faces a significant existential threat best described by the device-to-operator ratio. With the exponential growth of edge devices, managing and maintaining all these devices becomes an impossible task.

There will not be enough device technicians around to take care of all these devices. Therefore, a radical change to the ways we manage our edge devices is necessary.

## ■ The Smart Solution



**Innodisk's InnoAGE SSD** is an effective solution to this challenge.

Edge devices equipped with the Innodisk InnoAGE SSD can be remotely managed and maintained, allowing just a handful of technicians to handle thousands, tens of thousands, or even hundreds of thousands of devices.

More importantly, thanks to the InnoAGE SSD's out-of-band signaling technology, devices can be managed even if they have broken down, their system has crashed, or if there is a network outage.

In other words, with the InnoAGE SSD, on-site management of edge devices can largely be avoided—enabling greater numbers of devices and more geographic dispersion than ever before.

The InnoAGE SSD's more efficient management procedures also mean lower IT costs and less time wasted on fixing malfunctioning devices.

### **What is out-of-band signaling?**

Out-of-band signaling refers to any network connection that is separate from the “normal” (or “in-band”) connection. By bypassing the regular network channel and delivering a dedicated, alternate way to access the device, out-of-band signaling makes device control possible even if the device or its software has broken down.

Example: A weather station's operating system (OS) has malfunctioned, and the device's weather data can no longer be remotely accessed by staff using conventional means. Since system operators had equipped the weather station with an out-of-band signaling-enabled SSD, staffers can bypass the device's OS entirely and download critical weather data straight from the SSD using its independent network connection. After that, technicians can also upload a working copy of the operating system back to the device, restoring it to its normal operations.

## ■ Cutting-edge Security from Edge to Cloud

With every additional edge device, there is an additional attack surface for actors with malicious intent to exploit. Therefore, as the number of edge devices continues to grow, it is paramount that these devices are well-protected against present and future cybersecurity threats.

Thanks to Innodisk's signature hardware, firmware, and software security technologies and the integrated Microsoft Azure Sphere, the InnoAGE SSD provides a 360-degree solution to security concerns across three levels:

1. **Edge device security:** keeping edge devices and their data safe
2. **Secure connections:** ensuring that all communications between edge devices and the cloud are safe
3. **Cloud security:** Protecting cloud data and management features from malicious actors

In other words, the InnoAGE SSD makes devices fully equipped to tackle the challenging security environments found on the edge and beyond.

## ■ Enter the Era of the InnoAGE Edge

Together with our engineers and ecosystem partners, we have designed sophisticated concepts that demonstrate how the Innodisk InnoAGE SSD can improve edge computing in any industry and application.

Are you ready to take your edge computing to the next level?

### What is the Microsoft Azure Sphere?

The Azure Sphere is a microcontroller (MCU) purpose-designed for use in Internet of Things (IoT) applications by Microsoft. With built-in 360-degree security features and network connectivity, the Azure Sphere enables dependable security for devices it is integrated into—no matter where or how many they are.



# Manufacturing the Future Together: A Smart Factory Concept

## ***Bringing the future to the manufacturing sector with smart and robust components ready for AI on the edge***

Innodisk, with ecosystem partners DFI and Supermicro, created a concept factory that delivers exceptional operational efficiency and reduced costs by leveraging the best hardware in the industry.

### **Challenges**

- Downtime is required to be kept to a minimum to ensure maximum efficiency
- Staff needed to be able to manage devices in the factory even without staff on site
- In the event of device failure or service outages, devices still need to be accessed remotely for recovery purposes
- The components need to operate in challenging industrial conditions along all stages of the manufacturing process

### **Solutions**

- Industrial-grade InnoAGE SSDs with out-of-band management
- Innodisk's iCAP device management platform for seamless remote maintenance and management
- Innodisk's rugged DRAM and embedded peripherals for factory equipment and industrial PCs

### **Result**

By leveraging the Innodisk InnoAGE SSD throughout the smart factory's manufacturing process, the concept factory was able to ensure the best possible uptime. With the InnoAGE SSD's independent communication channel, factory operators were able to manage devices remotely, even in the event of equipment failure or a network outage—and regardless if any staff was physically present in the factory.

Thanks to the InnoAGE SSD's technology combined with Innodisk's signature ruggedness and its ecosystem partners' intelligent solutions, the smart factory proved a successful concept that serves as an inspiration in ongoing smart industry projects.

### **Partners**







# Enabling Better Shopping Experiences: A Smart Retail Concept

## ***Making shopping better for consumers while improving business for retailers with smart and connected technologies***

Innodisk created a smart retail concept based on retail industry demands and challenges, showcasing how AIoT technology can create a more enjoyable and more profitable shopping experience.

### **Challenges**

- Any devices must be able to guarantee the highest possible data security in order to safeguard customers' personal information
- System downtime risks completely crippling retail operations
- Remote management capabilities are crucial for ensuring cost-efficiency
- All devices and components need to provide excellent performance to enable seamless facial recognition for security and personalization purposes

### **Solutions**

- Industrial-grade InnoAGE SSDs with out-of-band management
- Innodisk's iCAP device management platform for easy remote maintenance and management
- Innodisk's high-performance DRAM and embedded peripherals for embedded PCs and network video recorders (NVRs)

### **Result**

By leveraging the InnoAGE SSD throughout both the shopping area and the supporting facilities, Innodisk was able to substantially improve the retail experience and operational efficiency without sacrificing security or system uptime. With the InnoAGE SSD integrated into devices like point of sale (POS) systems, fanless embedded PCs used in display kiosks, security devices, and throughout the warehouse, all improved aspects of the retail operations were secured and remote management-enabled by smart technology.

With the improved security and remote management capabilities that the InnoAGE SSD devices brought, the smart retail concept could confidently introduce facial recognition technologies and personalized shopping experiences without putting customers' personal information at risk. Moreover, operators would not need to worry about system downtime that could otherwise cripple operations.

As a result, the solution provided a better experience for customers while also addressing retailers' demands for profitability and reliability



# Intelligent and Connected Convenience: A Smart Vending Machine Concept

***Delighting customers with smarter and more interactive vending machines that also reduce costs and increase efficiency for operators***

Innodisk designed a smart vending machine concept that demonstrates how vending machine operators can use AIoT technology to improve profitability and provide customers with a superior shopping experience.

## Challenges

- Downtime is required to be kept to a minimum to ensure high service quality and an adequate profit margin
- Physical maintenance work needs to be infrequent to reduce costs
- Any devices and components must be able to withstand 24/7 operations in year-round climate and weather conditions

## Solutions

- Industrial-grade Innodisk InnoAGE SSDs with out-of-band management
- Innodisk's iCAP device management platform for seamless remote maintenance and management
- Innodisk's rugged hardware components that maintain high performance in any environment

## Result

By leveraging the Innodisk InnoAGE SSD, the smart vending machine concept provided a solution that introduces intelligent features without sacrificing valuable uptime or requiring extra maintenance work. On the contrary, the more sophisticated concept vending machine can manage inventory and forecast demand more effectively than traditional vending machines, thereby reducing the need for maintenance work. The result is a vending machine with features that customers enjoy, such as non-cash payment options, an attractive interface with special promotions and ads, and an optimized selection of products. All while reducing costs for the operator.

## Absolute Integration™

Absolute Integration™ is our envisioned path that moves toward a more interconnected world.

“To us, integration is not merely the combination of hardware, software and firmware; it is a philosophy that assimilates all relevant elements to create an optimal solution.”

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