Unlocking Efficiency

How the UP Squared 7100 Edge Helped Expand Smart Locker Units into New Territories

Introduction

The presence of smart lockers has increased exponentially in recent years, and can be seen across a multitude of settings ranging from offices, gyms, and hotels to sectors requiring larger-volume secure storage needs such as warehouses and airports.

In response to rising demand, a leading provider of plug-and-play smart locker solutions sought a space-efficient platform with a low energy footprint to help expand their operations into new territories. For this project, the customer chose AAEON's UP Squared 7100 Edge, a compact, fanless industrial Mini PC powered by the Intel® Processor N-series platform.

The UP Squared 7100 Edge – A Compact System with Wide-Ranging Functionality

AAEON's UP Squared 7100 Edge was the perfect candidate to act as the central controller for the project, not only meeting the customer's needs, but providing additional value beyond pure functionality.

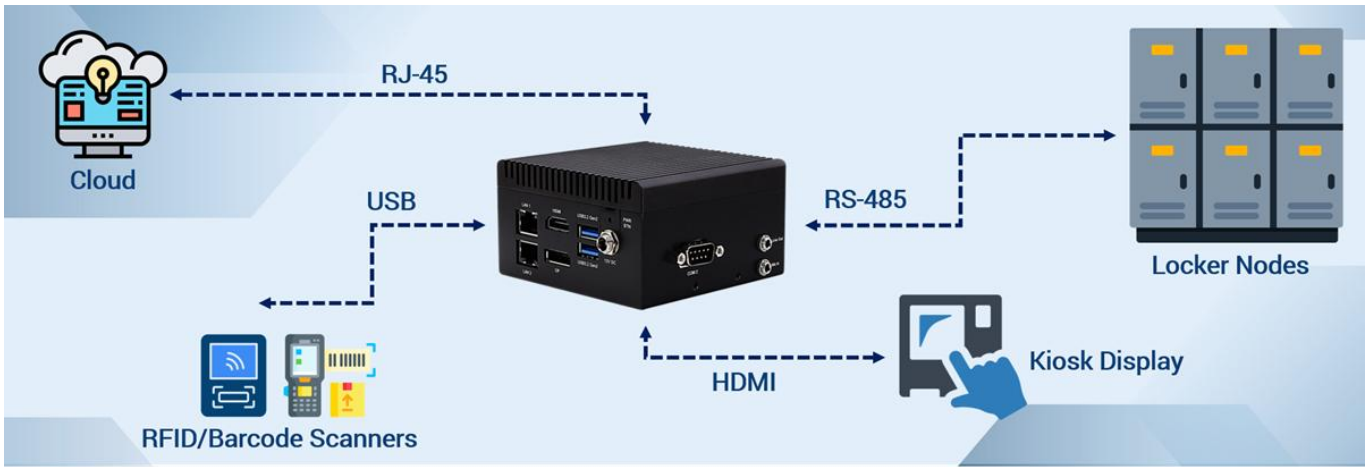
Measuring just 95mm x 95mm x 55mm, the PC's incredibly compact size made it ideal for discrete integration into the company's smart locker kiosks. Despite its small size, the UP Squared 7100 Edge could be installed in the limited space within the locker setup while maintaining adequate heat dissipation through its tailored heatsink, with the added benefit of eliminating the issues caused by dust accumulation that are commonly seen in fan-assisted systems.

In terms of power efficiency, the UP Squared 7100 Edge exceeded the customer's expectations, with the choice of either the Intel® Processor N97 or Intel® Processor N100 CPU (formerly Alder Lake-N). In this instance, the customer chose the UP Squared 7100 Edge with the 6W Intel® Processor N100 SoC, which has very little power draw even when active.

Augmenting this value was the Intel® Processor N100 CPU's power management architecture which allowed the system to drastically reduce energy expenditure while the application was idle.

Because of the smart locker's intermittent usage patterns, these additional power savings made for substantial gains in efficiency when put in the context of a large-scale deployment across hundreds of units.

The system also supports Enhanced Intel SpeedStep® Technology, allowing for voltage and frequency to be dynamically increased in response to the requirements of the processor, ensuring that when the application requires tasks to be executed, it can be done without latency.



The key thing that set the UP Squared 7100 Edge apart from other choices was its multifaceted and broad selection of interfaces, especially given its small size. The customer's existing smart locker infrastructure relied on RS-485 serial communication via COM port, and so the task of controlling the application's locker hardware leveraged the UP Squared 7100 Edge's dual COM ports.

Via its RS-485 interface, the UP Squared 7100 Edge was able to support up to 32 locker nodes connected in daisy-chain topology. This allowed users to enter a code for a specific locker, at which point the UP Squared 7100 Edge could send the necessary command for the locker associated with that node to be unlocked, while also receiving confirmation that it had been closed, via the sensor installed in each locker.

The UP Squared 7100 Edge also offered three USB 3.2 Gen 2 ports, granting the customer ample flexibility with which to integrate additional peripheral devices such as barcode scanners or RFID readers for additional methods of access, depending on the end user's preferred access method.

To enable cloud monitoring, the UP Squared 7100 Edge provided two RJ-45 ports with Gigabit Ethernet for reliable cloud communication. With this connection, all actions taken at device level (access requests, node functionality) could be synced with the customer's servers.

This also allowed for the remote monitoring of usage, helping the customer gain crucial business insights, such as occupancy rates and average duration of use.

As a final benefit, the UP Squared 7100 Edge offered two options for the customer to choose from when it came to the display panel on their locker kiosk setups. With both an HDMI 2.0b and DP 1.2 port, end users could be presented with attractive, branded visual displays when using the smart lockers.

Achieving Success at Scale

The customer successfully expanded the presence of their smart locker system into a number of new territories with the UP Squared 7100 Edge playing a pivotal role.

While the product's specifications ultimately aligned well with the customer's requirements, it should be noted that the service provided by AAEON's UP division went a long way in the customer's decision not only to choose AAEON as its partner in its first expansion into new sites, but also as its partner for future installations.

Of particular note was the rapid delivery of sample products for testing, allowing the customer to establish proof of concept and choose the most appropriate product, as well as the customer-centric approach shown by UP which ultimately expedited the customer's route to market.

About AAEON

Established in 1992, AAEON is one of the leading designers and manufacturers of industrial IoT and AI Edge solutions. With continual innovation as a core value, AAEON provides reliable, high-quality computing platforms including industrial motherboards and systems, rugged tablets, embedded AI Edge systems, uCPE network appliances, and LoRaWAN/WWAN solutions. AAEON also provides industry-leading experience and knowledge to provide OEM/ODM services worldwide. AAEON works closely with premier chip designers to deliver stable, reliable platforms. For an introduction to AAEON's expansive line of products and services, visit www.aaeon.com.