Touch, Tap, Charge

AAEON's PICO-IMX8PL Energizes EV UX

Introduction

The largest change to the automotive market since automatic gear transmission became a mainstream alternative to manual transmission, electric vehicles (EVs) have now scaled to the point that EV charging stations are commonplace across the infrastructure of towns and cities throughout the world.

A worldwide provider of EV charging equipment approached AAEON in search of a discrete platform capable of enhancing the user-friendliness of their EV charging stations.

A number of key stipulations, including the existing application infrastructure and the company's focus on energy efficiency made AAEON's PICO-IMX8PL – a low-power RISC-based 2.5" Pico-ITX single-board computer – the ideal candidate to help them succeed.

## Navigating Challenges to Deployment

As a company central to EV adoption, user-friendliness was the first priority for AAEON's customer. As such, the proposed charging stations would need to provide users with an easy-to-navigate and convenient UI, including a large panel interface with touch screen functionality. Beyond the technical considerations of this was the company's need to customize the look and feel of the application's user-facing interfaces while still running on a unified platform.

Consequently, they requested a platform that could run on Android™, which would allow them to dynamically tailor application display panel functions like multi-touch and gesture navigation, adjust the user interface for different screen sizes and orientations, while keeping the aesthetics of the display aligned with their company branding across sites.

Just as important to the customer was the environmental footprint of their application. Environmental sustainability is a key facet of the customer's brand proposition, and one that they incorporate into the solutions they provide.

Therefore, the embedded platform supplied by AAEON needed to be both energy-efficient and robust enough to cope with the deployment conditions required of it.

The Gateway to Deployment: AAEON's Agile Approach
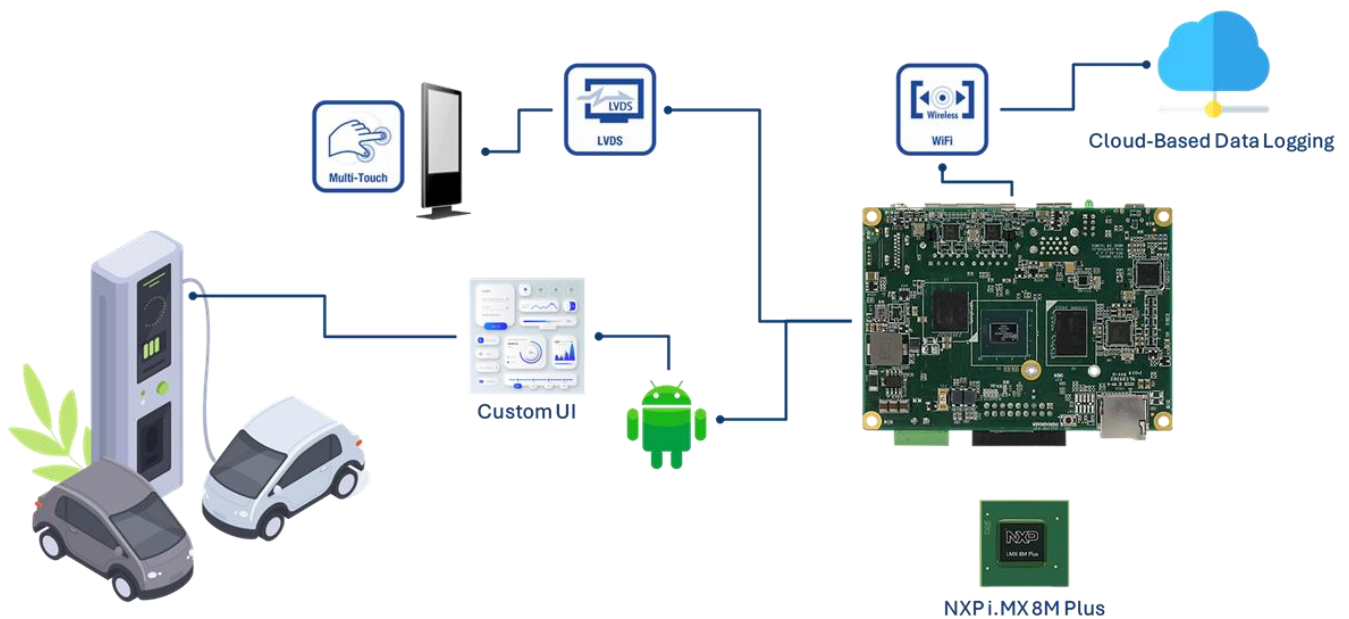
Choosing AAEON's PICO-IMX8PL for their EV charging station project granted the customer the key ingredients for the application, but given the value placed on end user satisfaction, they required a holistic approach to integration.

The Technical Suitability of the PICO-IMX8PL
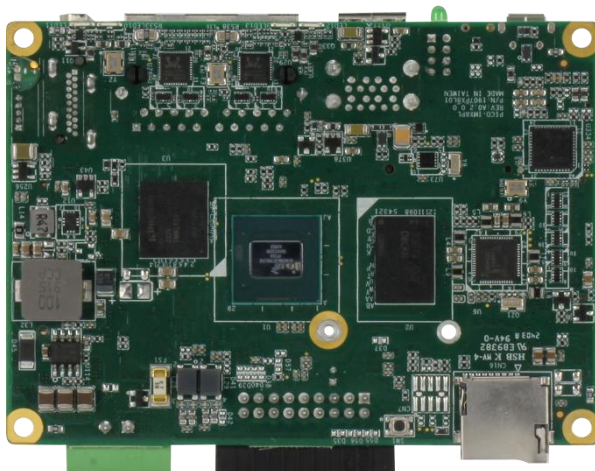
Firstly, it is important to highlight the technical suitability of the PICO-IMX8PL when it comes to the project. For one, the board is powered by the NXP i.MX 8M Plus platform, which incorporates a quad-core Arm® Cortex®-A53 processor with a Neural Processing Unit (NPU) operating at up to 2.3 TOPS.

This provided the EV charging station with more than enough processing power to operate smoothly while maintaining a low power profile, as the board consumes just 14.8W at full load, on average.

This made the PICO-IMX8PL not only an ideal platform for the power-efficient operation the customer sought, but also helped offset the typically greater power draw required when running applications on an Android™ OS, compared to lightweight operating systems like Linux.

Robust Design for Solution Longevity

With respect to deployment, the PICO-IMX8PL's design made it essentially the perfect fit. At just 100mm x 72mm, the board was not only small and easily integrated into the EV charging station, but also robust enough to operate in an outdoor environment. The board's robust design rested on two key design characteristics, its wide -40°C to 80°C temperature tolerance and its 9V to 36V power input range. While EV charging stations do not present the same degree of power supply variance as industrial environments such as factories, this feature did allow for agnostic deployment in otherwise less-ideal locations.

Multipurpose Wireless Support

For connectivity to peripheral devices within the charging station, the PICO-IMX8PL exceeded what was required, with Gigabit Ethernet joined by a host of industrial communication interfaces. It was, however, the tiny board's M.2 2230 E-Key slot that provided the greatest benefit to the application. By simply installing a Wi-Fi module, the customer was able to grant the charging station a method through which consistent cloud communication for data logging could be achieved, thereby reducing the need for in-field maintenance.

AAEON's Tailored Service

The final hurdle to successful deployment was configuring the touch panel function of the application. The prerequisite for an Android™ was easily satisfied given the PICO-IMX8PL offered a choice of Debian 11, Windows 10 IoT, Yocto, or Android™ 13. However, despite the OS' native support for multi-touch and gesture navigation, this still had to be configured on the station's user-facing panel, which utilized the PICO-IMX8PL's dual-channel LVDS interface.

It is in making this element of the application operational that AAEON's RISC computing division truly encapsulated AAEON's philosophy of agility and dedication to producing customer-centric solutions. Shipping the application's proposed touch panel to AAEON, a dedicated software engineer from its RISC computing division worked with the customer to configure the panel to exact specifications. As a result, the customer was able to deploy the EV charging station with a touch screen panel equipped with a UI conducive to easy user-friendly operation.

The Result
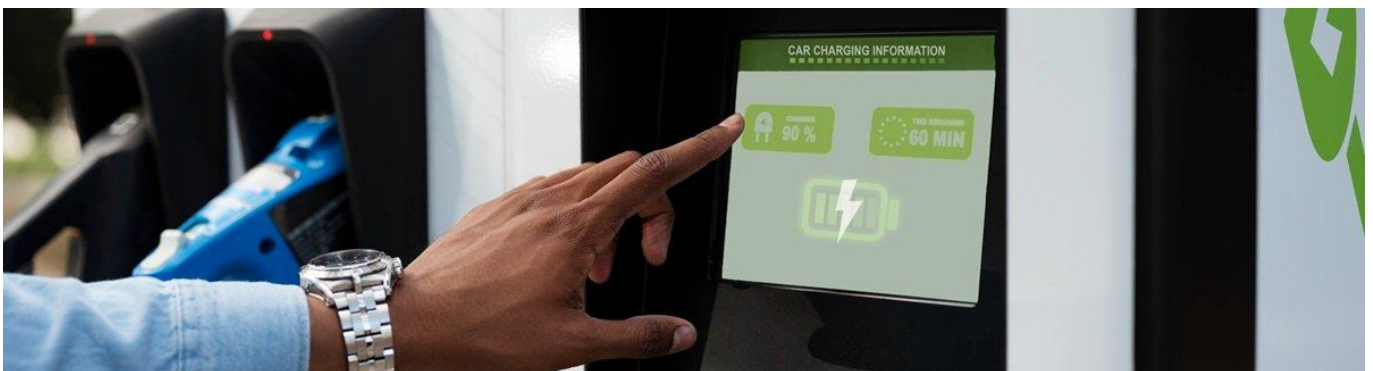
As a result of the PICO-IMX8PL's elite technical specifications, broad OS support, and environmental robustness, not to mention AAEON's technical expertise, the customer was able to launch their EV charging station application across multiple locations.

Following deployment, the application has not only delivered reliable performance, but the added value that comes from user satisfaction thanks to its smooth UI, flexible display capability, and reliable backend connectivity.

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.