



Advantech Powers Versatile Electric Vehicle Charging Systems with Help from AMD

MIO-5376, 3.5" Single-Board Computers Enable Highly Integrated EV Charger Designs to Ease User Experience and Deployment

PARTNER

ADVANTECH

INDUSTRY

Automotive: Electric Vehicle Charging

CHALLENGES

The growth of the EV charging infrastructure has not been able to keep up with the pace of rising EV sales. EV chargers must modular so the charging infrastructure can be deployed, serviced, and upgraded efficiently and economically.

SOLUTION

Advantech's MIO-5376, 3.5" (146mm x 102mm) Single-Board Computer leverages AMD Ryzen™ Embedded R2000 processors to deliver high-performance compute and graphics versatility, with expansive I/O and connectivity options and an industrial, wide operating temperature range, for highly integrated EV charger designs..

RESULTS

MIO-5376 SBCs are ideally suited for system integrators seeking an optimal balance of performance, I/O flexibility, and power efficiency for Level 3 rapid EV charging systems..

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ Embedded R2000 Processors

Electric vehicles (EVs) are growing in popularity as consumers seek to reduce carbon emissions contributing to air pollution and climate change. Government mandates and tax incentives are further helping to accelerate the adoption of EVs, and this is fueling an expansion in EV charging infrastructure to meet the growing need for EV recharging alongside roadways and parking areas.

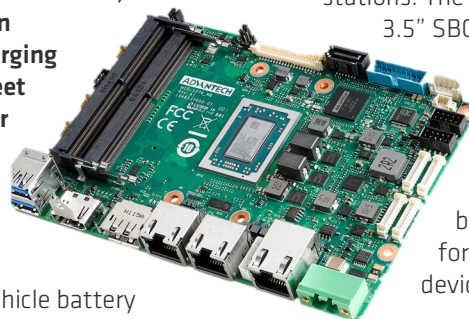
Fast and efficient vehicle battery charging stations will be essential for powering the next generation of EV fleets. The continued proliferation of EV chargers will also help to overcome consumers' lingering EV range anxieties, giving them the confidence that vehicle recharges are conveniently available when and where needed.

CHALLENGE

Electric vehicle sales have grown rapidly, but the charging infrastructure has not been able to keep up. Although home and work charging stations have increased in number, the public charging infrastructure remains insufficient to meet the need of greener transportation. EV chargers must be optimized with modularity in mind to help ensure EV charging infrastructure can be deployed, serviced, and upgraded efficiently and economically.

SOLUTION

Advantech (www.advantech.com) has established itself as a leading provider of single-board computers (SBCs) targeted for use in EV charging systems and stations. The company's MIO series of 3.5" SBCs are ruggedized for reliable operation in harsh roadside and industrial environments and provide comprehensive industrial buses and protocol support for integrating additional devices.



This is important because an EV charging system typically integrates multiple subsystems, each using different control buses by domain preference. These subsystems can be designed to connect with voltage meters, battery control logic, external management, and payment systems – and HMI displays, just like you'd find at a gas station.

Advantech's MIO-5376 SBCs—built on AMD Ryzen™ Embedded R2000 Series processors—make it easy for system integrators to design EV chargers. Leveraging up to four "Zen+" x86 integrated CPU cores with onboard Radeon™ graphics, AMD Ryzen Embedded R2000 processors are ideally suited to meet the compute and graphics needs of next-generation EV charger system integrators.

Advantech's MIO-5376 SBCs integrate three ports of 2.5GbE (including two

optional PoE ports), CANBus, high-speed UARTs (4X), and an I2C bus to help system integrators streamline their EV charger designs to reduce complexity and cost. Additionally, MIO-5376 implements the PoE function by adding one small MIOe-PSE module. The existing Ethernet ports can support up to two 15.4W connections for each port, which can deliver power and data for PoE devices, such as IP cameras in EV charging systems. This feature simplifies deployment by using only one single cable, which can reduce cabling space and installation costs. Moreover, MIO-5376 provides for state-of-the-art network expansion M.2 E-key and B-key ports to support 5G and WiFi, and an expansion slot on M.2 2280 for PCIe Gen3x4, SATA SSD storage.

The plug and play connectivity enabled by the MIO-5376 SBC helps ensure subsystems can be swapped in/out of EV charging systems with ease, flexibly accommodating modules to simplify repair/maintenance as well as future upgrades.

RESULT

A single, small-footprint AMD Ryzen Embedded R2000 processor can power up to four independent displays in crisp 4K resolution leveraging DisplayPort™ 1.4, HDMI™ 2.0b, or eDP 1.3 interfaces, each supporting up to 4K60 resolution. For EV charging systems, AMD Ryzen Embedded R2000 processors can help enable flexible display and HMI configurations in space- and/or thermally constrained environments – a crucial

consideration for densely clustered metro settings, particularly in hot climates.

The AMD Ryzen Embedded R2000 processors onboard Advantech's MIO-5376 SBCs are available in 15W or 25W options, to meet a diverse range of power and performance requirements. The 15W version is designed for fanless system designs and optimized for reliability and ruggedness, while the 25W version is available with an efficient slim-line cooler for EV charging systems needing an additional performance boost.

Power efficiency is paramount at every layer of the EV charging infrastructure, from processor to pump. The system modularity enabled with SBC solutions like Advantech's MIO-5376 is likewise critical for streamlining design complexity and costs, helping to ensure that EV charging stations can be economically deployed and serviced at the massive scale that's needed to support next-generation EV fleets.

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About Advantech

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www.advantech.com.

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