

Advantech Launches the AFE-R770 to Optimize Stability, Connectivity, and AMR Efficiency

Taipei, Taiwan, June 24, 2024 **-** Advantech (TWSE: 2395), a global leader in AIoT and Edge Computing, listed in the Dow Jones Sustainability World Index (DJSI-World) in 2023 and included in the prestigious S&P Global 2024 Sustainability Yearbook in 2024, is thrilled to introduce the AFE-R770 AMR (Autonomous Mobile Robot) control system. With rising labor costs and an aging population, businesses worldwide are increasingly turning to automation to optimize resources and remain competitive.

The AFE-R770 marks Advantech's first dedicated system for the AMR market. Its design is specifically tailored for AMR usage applications, considering specifications like dimensions, operating temperature, voltage, shock resistance, anti-noise features, and wireless connectivity. The system seamlessly integrates essential components such as Lidar, Cameras, IMU, vehicles, and batteries. It also comes with an AMR operating system, drivers, ROS2 environment, AI tools, simulation capabilities, SLAM, and navigation tools, providing developers with a rapid and user-friendly environment for both hardware and software development.

Dedicated I/O design for Enhanced AMR Efficiency

The AFE-R770 control system is tailored for AMR forklifts. It features four network interfaces for Lidar devices and USB ports with 1.5A power for connecting a ToF camera. The system also includes CAN bus and COM ports for integrating with the vehicle chassis, along with a 16-bit isolated DIO for alarms, emergency switches, warning lights, and other essential functions.

To manage voltage fluctuations during operation, the AFE-R770 system supports a wide input voltage range of 9-36 VDC, ensuring stability and compatibility with different battery cell combinations. Additionally, the system includes an ignition switch design, providing flexibility for both traditional and fully electric forklifts. This comprehensive I/O design ensures efficient and reliable performance for AMR forklifts in various scenarios.

Ultra-Thin Design for Limited Vehicle Space and Efficient Heat Management

The design of AMR vehicles requires significant space for operational needs, with cargo space reserved for transporting goods and chassis space allocated for battery modules to extend standby time. This leaves limited room for controllers, making size and heat dissipation crucial factors. Considering the increasingly thin designs of AMR chassis, the AFE-R770 features an ultra-thin profile with a height of only 55mm, allowing for easy installation in confined spaces. Additionally, to address potential temperature rise issues in these small spaces, we have enhanced the system's heat dissipation design. The fanless model can operate in temperatures up to 65°C, and with a fan, it can withstand temperatures up to 70°C, effectively supporting temperature management in compact environments.

Enhanced Stability and Connectivity for Mobile AMRs

Unlike traditional stationary equipment, which can establish solid grounding paths, mobile AMRs cannot connect to ground lines, and are thus more susceptible to noise and electrostatic interference. To address these challenges, we have enhanced protection by incorporating isolated designs for critical I/O interfaces and increasing the ESD protection levels to 8KV for contact and 15KV for air discharge, with TVS protection. This ensures that AMRs can operate more stably without being affected by noise or static interference.

In scenarios where signal strength is weak, such as outdoor locations or high-precision indoor applications, the inclusion of an IMU (Inertial Measurement Unit) is crucial. The IMU provides AMRs with posture and trajectory tracking capabilities. The AFE-R770 supports internal IMU expansion, and when paired with Movella’s IMU, it saves external expansion space and enhances system stability by maintaining a consistent magnetic environment.

In large indoor spaces, users often experience disconnection issues when switching between different access points (APs). The AFE-R770, when used with Advantech AIW wireless modules, enables fast roaming. This allows the system to automatically detect signal strength and seamlessly switch between APs, preventing disconnection problems during movement.

Get Ready to Streamline AMR Development with the Advantech Robotic Suite

The development process can be lengthy and tedious for R&D personnel. To help AMR development teams accelerate their progress, the Advantech team has continuously sought innovative solutions. As a result, we have packaged early-stage software and hardware compatibility tests, drivers, an ROS environment, common utilities, and AI tools into the Robotic Suite.

Additionally, we provide various control parameter adjustments and sample code tailored for AMR usage scenarios, enabling customers to quickly get started and make necessary adjustments. This suite supports vehicle control, navigation and SLAM, scenario simulation, and pallet barcode recognition, and other utilities.

Advantech's AFE-R770 is now available for order. For more information about the AFE-R770 or other Advantech products and services, please contact your local sales support team or visit our website at https://campaign.advantech.online/en/AMR-Robotic-Solutions/.

Key Features

- Supports Intel® 12th/13th/14th Gen Core™ i3/i5/i7/i9 processors
- Dedicated I/O for AMR : 4 x 2.5GbE, 4 x USB 3.2, 2 x CAN bus, 4 x RS-232/422/485, 16-bit DIO
- 9-36 VDC with switchable ignition / PC power on mode for battery connection
- Supports Xsens IMU/AHRS sensors
- ESD protection: up to contact 8KV, air 15KV
- Wide operating temp from -20 ~ 65°C
- Supports Ubuntu 22.04 with real-time patch and Advantech Robotic Suite for ROS2

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About Advantech

Advantech has the corporate vision to "Enable an Intelligent Planet". The company is a global leader in the fields of IoT intelligent systems and embedded platforms. To embrace the trends of IoT, big data, and artificial intelligence, Advantech promotes IoT hardware and software solutions with the industrial IoT platform, WISE-IoT Core, to assist business partners and clients in connecting their industrial chains. Advantech is also working with business partners to co-create business ecosystems that accelerate the goal of industrial intelligence. (www.advantech.com)

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