DFI

Autonomous Mobile Robots with Higher Software and Hardware Integration Create Non-Stop IC Packaging and Testing

Autonomous Mobile Robots (AMR) have higher application flexibility than Automated Guided Vehicles (AGV) and have become a primary product in manufacturing, logistics and warehousing, and healthcare. Due to the need to integrate more versatile sensing devices for the robots deployed in the IC packaging and testing industry, DFI's EC500-SD with powerful computing performance, sturdy fanless structure, compatibility with all industrial cameras, high scalability, and flexibility, brings a higher degree to software and hardware integration.
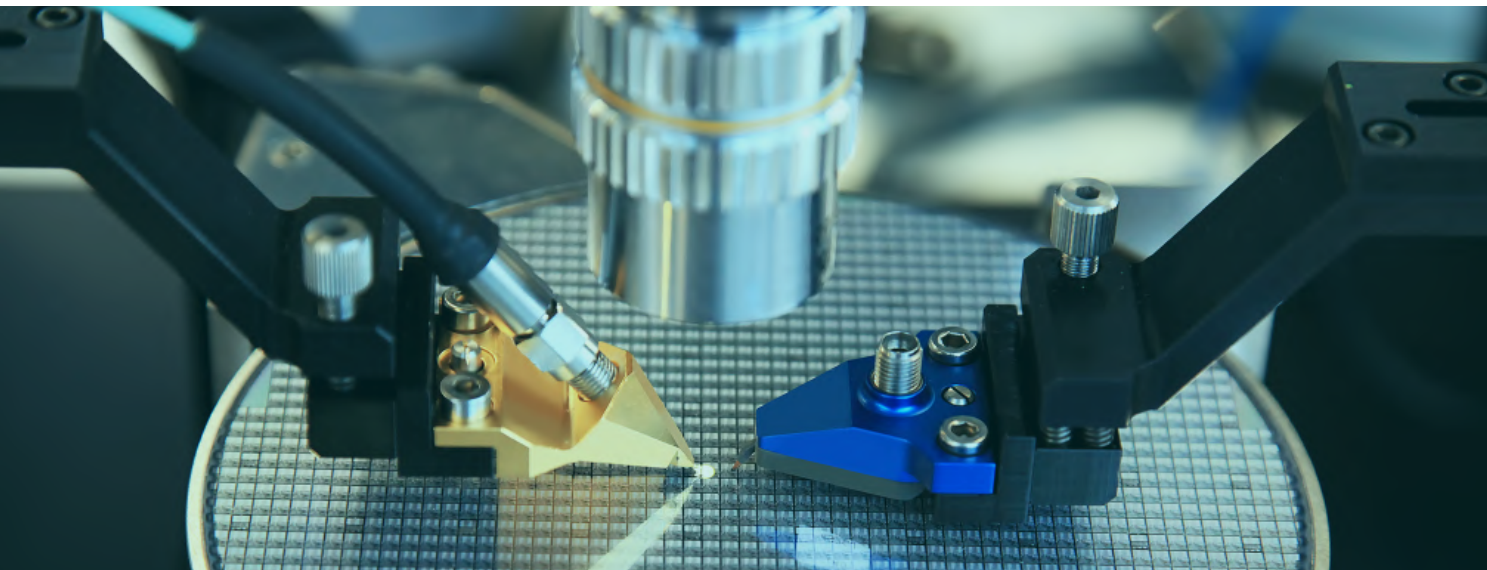
Region: **Taiwan**
Industry: **IC Packaging and Testing**
Application: **Autonomous Mobile Robots (AMR)**
Solution: **EC500-SD**

Since the automated guided vehicle (AGV) must be deployed in a pre-planned environment, the overall deployment cost is relatively high, and it is also difficult to cope with unexpected situations. For example, once an obstacle is encountered during transportation, the operation can only be suspended. Therefore, autonomous mobile robots (AMR) with independent guidance, machine vision, and map construction capabilities can automatically determine the most effective path and avoid obstacles. AMR's ability to overcome the barriers and environmental adaptability is becoming necessary for more complex plant and storage placement.

However, autonomous mobile robots need to integrate with more versatile sensors, includingdepth cameras and laser radars for positioning, laser scanners to prevent long-distance collisions, ultrasonic sensors to detect short-distance collisions, and various wireless network specifications and control drives technology. A world-renowned IC packaging and testing company in Taiwan initially used an industrial computer solution.
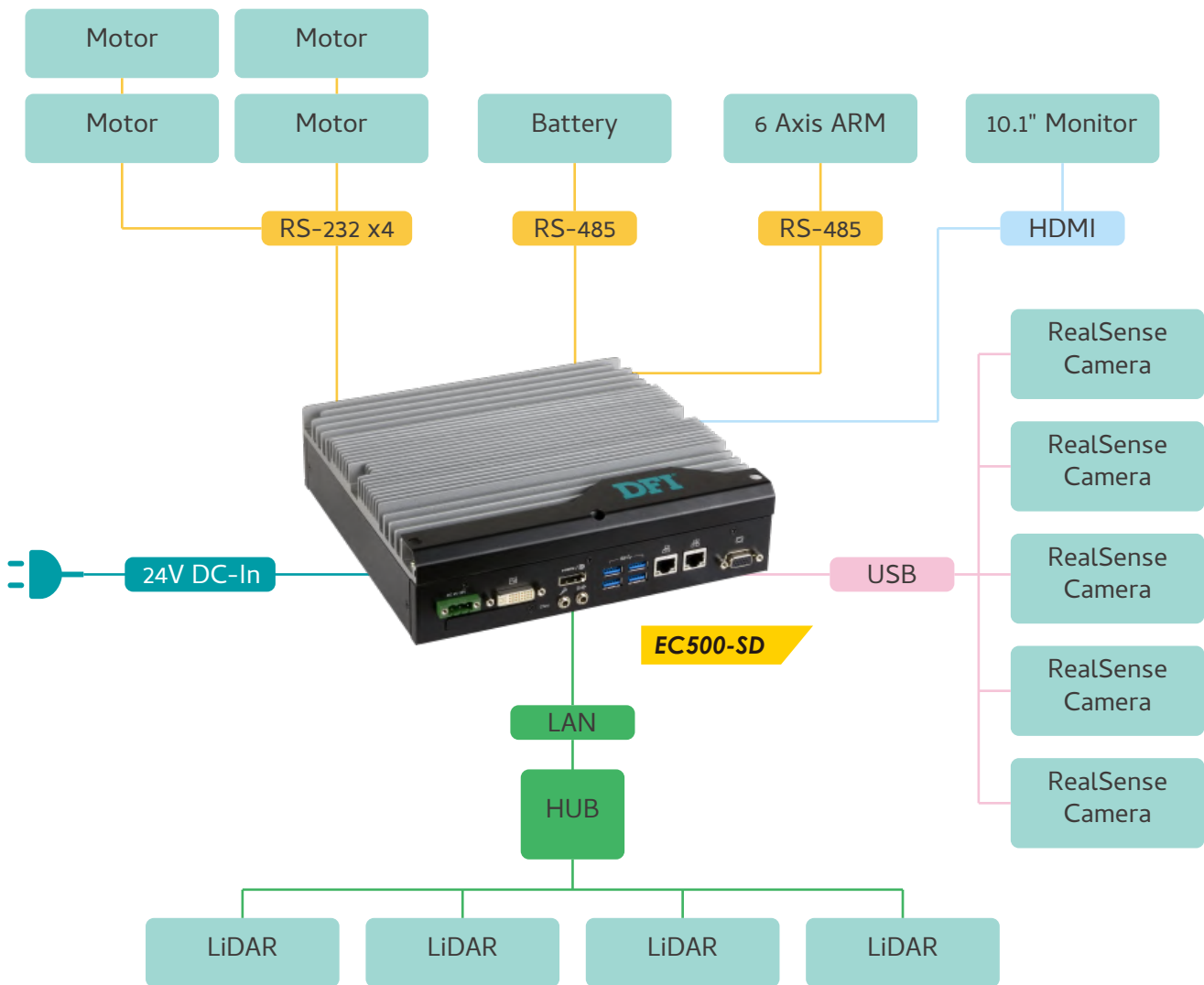
However, the number of COM ports and USB units was not enough to meet the demand, leading to the requirement for additional controllers.

In addition to the perfect integration of complex sensors, autonomous mobile robots must perform more complex real-time machine vision analysis, as well as simultaneous localization and mapping (SLAM) algorithms, customized application programming interface (API), and higher system integration to ensure seamless compatibility and maximize execution performance. Finally, for IC packaging and testing to meet companies' production line operation requirements, industrial displays must be installed. Which means that system integration (SI) services from industrial computer manufacturers are required to create the most well-designed autonomous mobile robot.

The world's top IC packaging and testing company adopted DFI's EC500-SD as its autonomous mobile robot's computing brain. The EC500-SD series is equipped with a 6th generation Intel® Core™-i processor and Intel® Q170 chipset, providing good
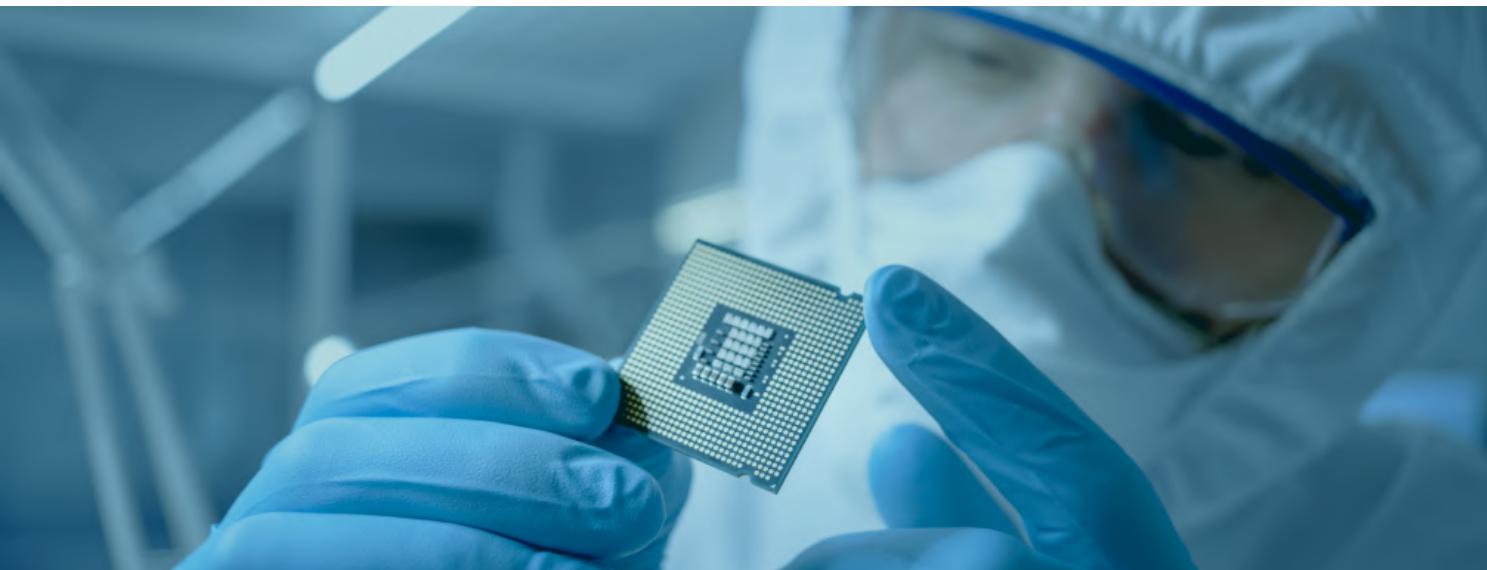
computing performance with many industrial-grade I/O interfaces and PCI/PCIe expansion slots. It is specially equipped with four full-speed PoE to support IEEE 802.3af and 4 USB 3.0 camera interfaces, and have up to 5Gb/s data transmission speed, providing the maximum image capture bandwidth for machine vision systems. In addition to hardware specifications, DFI provides customized application programming interfaces, and the integration of the Linux operating system is also better than previous solutions. DFI also provides integrated technical services for industrial-grade displays.

This robot has passed a variety of semiconductor certification such as Environmental Health and Safety (SEMI-S2), Ergonomics Engineering of Semiconductor Manufacturing Equipment (SEMI-S8), Risk Assessment and Risk Evaluation Process (SEMI-S10), Documents Provided to the Equipment User for Use With Manufacturing Equipment (SEMI-S13), Fire Risk Assessment and Mitigation for Semiconductor Manufacturing Equipment (SEMI-S14), Unmanned Transport Vehicle (SEMI-S17), and the Electrical Design of Semiconductor Manufacturing Equipment

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(SEMI-S22). What's more, is that it also passed safety requirements for industrial robots (ISO 10218-1) and collaborative industrial robot systems and the work environment (ISO 15066).

Due to the completeness of DFI's solution and the practical deployment of this case, application architecture will also be introduced in the future to another autonomous mobile robot partner for more in-depth promotion. EC500-SD supports a 15-year long-term supply of CPUs to the fourth quarter of 2030, ensuring a highly integrated architecture and a great investment return.

Please click or scan the QR code to fill out an inquiry form if you would like us to contact you.

Learn More About Our Success Stories On Robot

EC70A-SU/KU Series

AMR For Transportation

EC511-SD

Bridge Crane

EC700-BT

Shuttle Between Shelves

DFI

Founded in 1981, DFI is a global leading provider of high-performance computing technology across multiple embedded industries. With its innovative design and premium quality management system, DFI's industrial-grade solutions enable customers to optimize their equipment and ensure high reliability, long-term life cycle, and 24/7 durability in a breadth of markets including factory automation, medical, gaming, transportation, smart energy, defense, and intelligent retail.
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