DFI

The Thin and Shock-Resistant Fanless Embedded System Helps Create a Highly Efficient Cleaning Service Robot

With the declining birthrate of advanced countries, the working population continues to decrease. And due to the impact of COVID-19 in 2020, whether in their own homes, hotels, or hospitals, people stay indoors for longer period of time, and a clean living environment becomes first priority. The matter has also increased the demand for sweeping robots. With its thin appearance, high durability, powerful performance, and complete I/O interface, DFI EC70A-SU has become the brain of a certain automatic sweeping robot product line in China.

Region: **China**
Industry: **Smart sweeping solutions**
Application: **Automatic sweeping robot**
Solution: **EC70A-SU**

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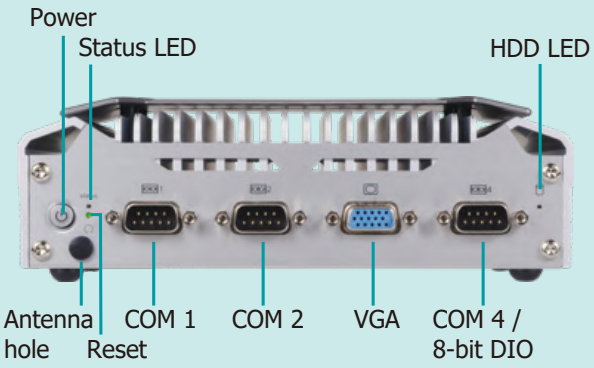
A Chinese robot manufacturer, established in 2012, is committed to the research of the autonomous positioning and navigation technology for indoor mobile robots, developing a series of intelligent sweeper solutions, and transforming traditional industrial sweepers to provide intelligent functions. The essential technologies of autonomous mobile robots (AMR) must be readily available. Furthermore, because they have to face various indoor environments and temporary conditions, they must have a more vital ability to perceive the surrounding environment and human-machine interaction. E.g.:

- Map generation and autonomous cleaning: Robotic environment perception technology automatically realizes two-dimensional or three-dimensional environment modeling. Independent path planning recognizes autonomous navigation and cleaning, and can plan the path through software and clean according to the intended direction.
- Intelligent pathfinding, error correction, and obstacle avoidance: The laser-ranging sensor with accurate distance measurement on the front can automatically avoid obstacles. The inertial sensor calculates the deviation of the route in real-time and automatically fine-tunes the error correction. In addition, the robot motion control algorithm can smoothly control the driving speed.
- Near-end monitoring and event reporting to issue work tasks, update maps, and adjust the direction of travel: Self-status report and query, such as battery power, water tank status, etc., remind users to carry out related processing. By recording the cleaned area in real-time and the track on the map, when it is blocked by an obstacle, the robots will alert, report, and notify nearby personnel to take action.
- Remote monitoring and centralized management: Remote system management can be deployed locally or in the cloud, supporting multiple terminal devices such as mobile phones, tablets, computers, and keep sweeper status monitored, track and location query, classification statistics, and remote intervention.

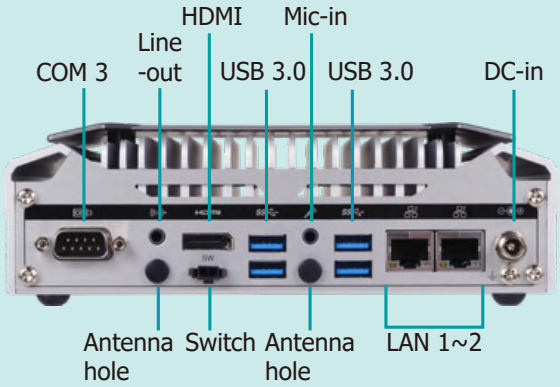
This manufacturer chose DFI's EC70A-SU as the computing brain of the sweeping robot because of its ultra-thin form factor, on-board CPU, on-board memory, and mSATA SSD support, which meets the shock resistance and small space heat dissipation requirements for the movements of the robot. In addition, EC70A-SU has powerful computing performance and a complete I/O interface, which also meets the needs of sweeping robots that must be connected to many sensors and cleaning mechanisms. Furthermore, according to the Intel IOTG product schedule, the Intel processor used in the EC70A-SU will be available until the third quarter of 2030, which means that there is no need to worry about stock-out and improve the return investment of product development.

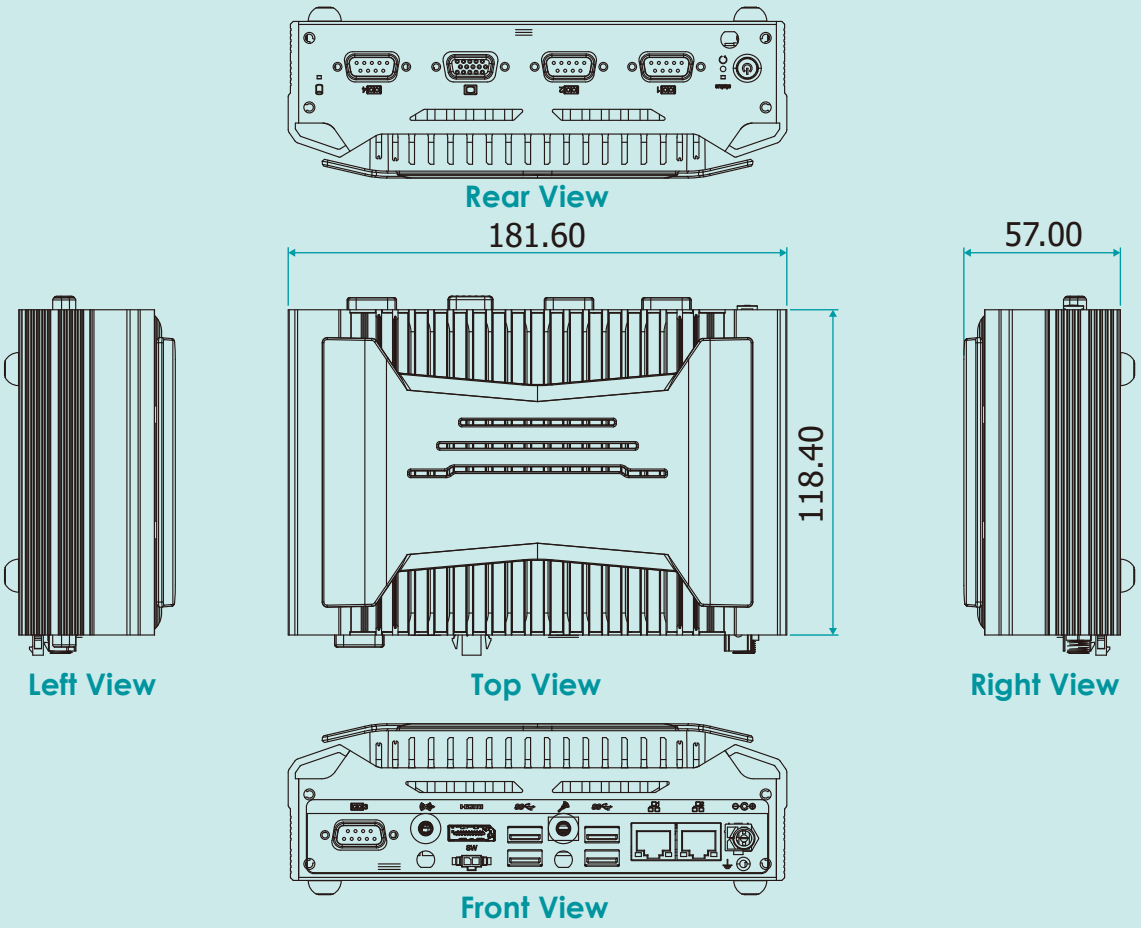
With the impact of the COVID-19, "zero contact" has become the most popular term, and it has gradually changed the way people live. In addition, the epidemic has increased the sales and popularity of sweeping robots and placed more demands on robots. As a result, the concept of "healthy home appliances" has become more and more popular with consumers. DFI's series of fanless embedded systems with an extensive range of applications will also bring more possibilities to the concept of healthy home appliances.

Front View



Rear View





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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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