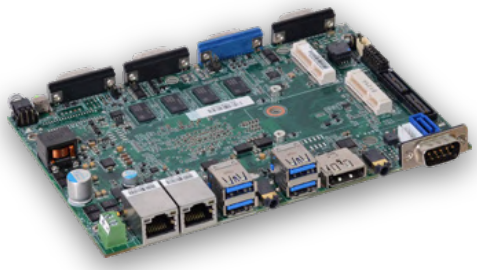
DFI

High Shock Resistance, Wide Voltage, and Rich I/O Interfaces to Assist In The Creation of Unique Firefighting Robots

The world we live in is not peaceful. Natural and artificial disasters, such as fires and bombers that can be heard everywhere, often occur, and to replace humans in dangerous areas, the public safety robots and unique operation robots were made. With onboard memory that makes the motherboard more shock-resistant, wide-voltage input that adapts to the unstable power supply voltage, and rich I/O interface that connects a large number of mechanical structures and sensors, DFI's SU253 assists Chinese manufacturers to develop a firefighting robot as a substitute for firefighters in dangerous situations at the scene of the accident.

Region: **China**
Industry: **Special Robot**
Application: **Firefighting Robot**
Solution: **SU253 Single-Board Computer (SBC)**



Case Study: Success Story

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With the long-term development of related technologies, the application of robots has long been ubiquitous,and it has been further extended to the fields of public safety. Special operations, such as intelligent security inspections, investigations and explosions, armed strikes, firefighting, vehicle chassis inspections, underwater operations, pipeline inspection, and wall-climbing inspection are dangerous applications where robots can replace humans. Among them, fires, which we hear from time to time in our daily lives, are occasions where demand is the most urgent.

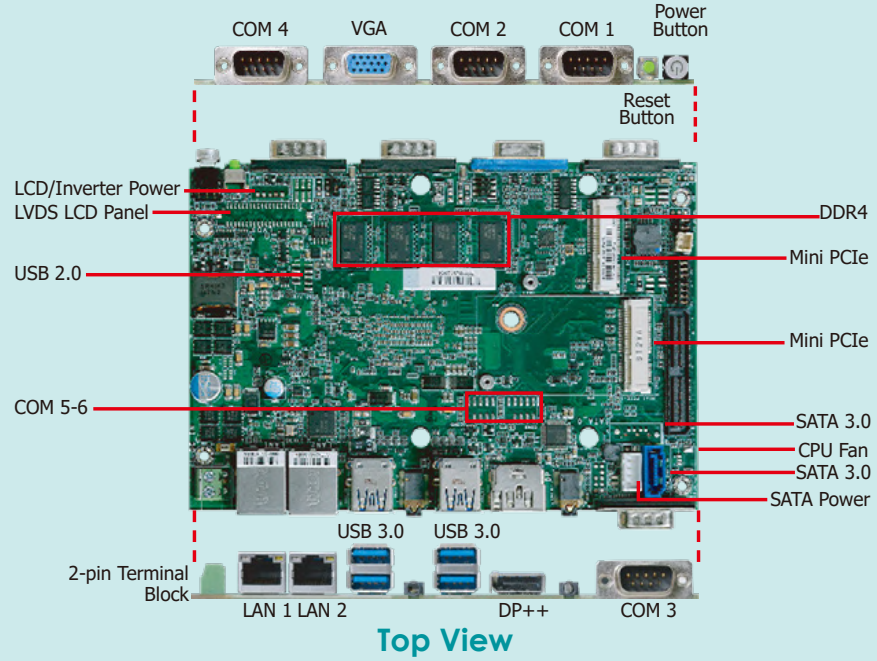
A group of robotics research and development institutions was established in 2014 in China, and promotes robotics and related innovative equipment through the in-depth integration of industry and academia. R&D centers across China have developed more than 30 categories and more than 200 robotic products. And their products cover smart factories, industrial robots, service robots, unique robots, cultural travel robots, and medical robots.

Its crawler-moving firefighting robot is designed to be explosion-proof, waterproof, and dust-proof so it can replace fire rescue personnel in flammable, explosive, toxic, oxygen-deficient, dense smoke, and other dangerous disaster accidents and situations. Moreover, it uses a camera installed in the tripod head and handheld remote controller (both remote wireless or wired, the maximum communication distance is 500 meters) to complete data collection, processing, feedback, fire control, and etc. It can operate normally in an all-weather environment. The battery can provide electricity for eight hours of continuous work.

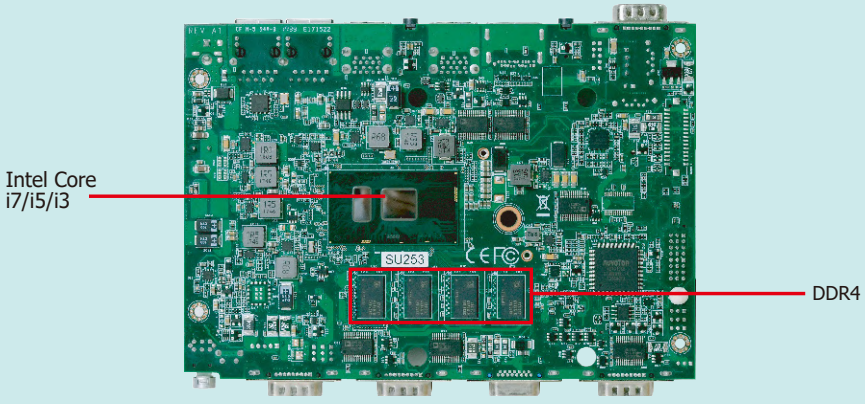
It features high-speed movement (2.3M/sec), mechanical variable speed function, excellent creeping wave ability of more than 40 degrees, and obstacle crossing ability of more than 300mm; the effective load is up to 200 kg. Therefore, in addition to urban fire protection, it is also suitable for earthquake relief. In addition, this research and development organization group also launched a

homologous crawler-type fire extinguishing robot with fire water cannons, tripod head cameras, and fire source identification functions to replace fire rescue personnel in firefighting operations, especially when it is a hazardous high-rise fire.

Therefore, it is not difficult to imagine that the components used need to be rigorously tested before being deployed in hazardous areas. The computing brain of this firefighting robot uses DFI's SU253 single-board computer. The reason is the excellent shock resistance of the onboard memory and the low-power and extendable battery of the Intel sixth-generation low-voltage Core processor. The wide voltage can adapt to unstable current input and rich I/O interfaces enough to connect any peripheral devices. Its compact size and low height are more conducive to system integration, hiding the computing brain in the depths of the robot that is least prone to direct damage.



Top View



Bottom View

In addition, according to the Intel IOTG product schedule, the processor used by SU253 will be available until the third quarter of 2030, which means that this R&D organization group does not need to modify the product design within a few years. For unique products that require long-term service in government agencies, these robots are a convenient solution to maintain the consistency of maintenance work and increase the chances of saving lives at precarious disaster sites.

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DFI

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