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IOT Based Robotic Arm

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Abstract: *In response to the escalating threats proposed by explosive devices in various environments, the development of advanced technologies for effective bomb detection and diffusion has become imperative. This paper introduces state-of-the-art features of the robot include a robust mechanical structure with a manipulator arm equipped with specialized tools for safe handling and defusing of explosive devices. Wireless communication capabilities facilitate seamless interaction between the robot and its operators, allowing for real-time control and monitoring. Safety is paramount, and the robot is equipped with IP built-in security measures, including emergency shutdown mechanisms and protective systems to mitigate risks during explosive diffusion operations. The integration of low-power modes enhances the robot's endurance in prolonged missions. A six degree of freedom robotic arm is the most widely used mechanical device in the field of robotics. It can work in the various complex environment and has the accuracy and precision that the human arm cannot achieve. Generally, the motion of a robotic arm needs to be controlled by a wired teach pendant or computer control. However, in some complex environments, it is impossible to achieve short- distance control wireless control. Real-time remote data transmission is also the key to achieve precise control of the robotic arm, and if the control terminal can be realized anytime and anywhere, the robotic arm can be controlled remotely. Internet of Things (IoT) and web applications can solve these problems of near real-time data transmission as well as multi-platform realization at the control end. In this paper we present a design and implementation of a web-based control of the robotic arm using on MQTT (Message Queuing Telemetry Transport) communication protocol and ESP32 (a network data transmission module).*

Keywords: ESP32, Internet of Things(IOT), Message Queuing Telemetry Transport (MQTT)

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