

Development of wireless controlling and monitoring system for robotic hand using Zigbee protocol

ABSTRACT

Nowadays, the robotic arm is fast becoming the most popular robotic form used in the industry among others. Therefore, the issues regarding remote monitoring and controlling system are very important, which measures different environmental parameters at a distance away from the room and sets various condition for a desired environment through a wireless communication system operated from a central room. Thus, it is crucial to create a programming system which can control the movement of each part of the industrial robot in order to ensure it functions properly. EDARM ED-7100 is one of the simplest models of the robotic arm, which has a manual controller to control the movement of the robotic arm. In order to improve this control system, a new controller system was redesigned in this work by using Zigbee. It is a communication protocol for safety and economic data communication in an industrial field, where the wired communication is either expensive or difficult under physical and experimental conditions, such as the worker cannot recognize the error through the manufacturing process. Hence, this paper introduced a system that used microcontroller (AT89S52) with wireless devices (Zigbee) and sensors to control the robotic hand (EDARM ED-7100) and to monitor the information regarding the robot's parameter using WiFi technology. A mathematical model was derived through an empirical method to specify the robot's configuration changes. In this work, the ability of controlling system had increased, as well as hardware, while the necessities of other similar equipment for data communication were minimized. In addition, it presents the comparison of two controlling systems: using the Zigbee and without using it. Based from the experiment it can be safely concluded that the robotic arm's movement had followed a linear function.

Keyword: Arm robot (EDARM ED-7100); Controller and monitoring; design; Wireless