WSN-based Automatic Monitoring Management Platform for Plant Factory

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Abstract

In recent years, the phenomenon of global warming has become increasingly serious, resulting from human factors such as excessive increases of human and environmental pollution and gas emissions and depletion of natural resources. According to research, global warming leads to desertification, drought, reduction of rainfall and the crisis of a lack of fresh water. Due to the continual growth of the global population, available resources are being depleted and water and food pollution is serious. The extreme environmental changing, the food crisis and the water resources have become an important issue in international. Today, there is a new concept in agricultural development called a "Plant Factory" which could mass produce plants economically. Furthermore, the plant factory could overcome the effect of change of climate, environmental contamination and resource depletion. This study proposes an automatic monitoring management platform for a plant factory. The platform adopts automatic management to replace manpower with sensor technology to monitor and control the plants' environment. Moreover, it is based on a Wireless Sensor Network (WSN), Zigbee-based wireless transmission, and integrating components of sensor technology. All related information of plant's growth will be delivered to the system for automatic adjustment of maintenance jobs. The proposed WSN-based automatic management platform reduces manpower costs, effectively achieves carbon reduction and is energy saving.

Keyword：wireless sensor network, Zigbee, management platform, plant factory