
基于 Arduino 平台的工业用灰尘浓度测定系统研究

摘 要

如今随着国民需求的增加，我国工业化进程越来越快，经济开发区各种工业设施排放的大量工业废气导致其周边城市空气污染越发严重，空气中的有害微尘不但会导致周围环境质量变差、影响动植物的生长繁衍，而且会对人类的生命健康产生极大的影响。所以在新时代工业化进程中，如何降低工业活动产生的工业废气对生态环境的污染情况，是当下我国需要尽快解决的重要问题之一。

本文介绍了工业微尘浓度检测系统的整体设计方案、相关技术的发展历程、采集端的相关说明、云服务器的构建方式、系统调试过程和最终调试结果。整个系统的硬件端主要使用 GP2Y1014AU 传感器对环境中的微尘颗粒物浓度进行采集、监测，为了确保工业微尘颗粒物浓度监测的准确性，本设计加入了温湿度传感器对检测区域的温湿度情况进行收集，最终检测数据会通过 Wi-Fi 无线传输模块进行数据无线传输，服务器接收到检测数据后，经过处理将结果反馈至远程显示端，微尘数据情况会通过 TFT-LCD 显示模块进行实时显示，如果微尘浓度超出标准情况时间会触发预警机制。最终实现了远程监管工业微尘排放检测功能。

关键词：工业微尘浓度；传感器；GP2Y1014AU；无线通信

Abstract

Nowadays with the increase of the national demand, China's industrialization process faster and faster, economic development zone, a large amount for industrial waste gas had been discharged from all kinds for industrial facilities, wish the air pollution on surrounding cities has become increasingly serious, harmful dust in the air is not only the deterioration in the environment quality is poor, influence the growth of plant and animal breeding, and will have great impact to human life and health. Therefore, of the process for industrialization wish the new era, It is a important problem from China to solve as soon as possible how of reduce the pollution caused wish the industrial waste gas.

The invention provides an overall design scheme of an industrial dust concentration detection system and a development method of related technologies, the relevant instructions of the collection terminal, the construction method of the cloud server, the system debugging process and the final debugging results. The hardware side of the whole system mainly use GP2Y1014AU sensor for acquisition of tiny particles of dust concentration in the environment, monitoring, in order to ensure the accuracy of industrial dust particle concentration monitoring, this design joined the temperature and humidity sensors to detect the temperature and humidity of the regional situation are collected, the final test data is transferred via wi-fi wireless module for wireless data transmission, the server receives the testing data, the processed results feedback to the remote display terminal, dust data will be through the TFT - LCD display module for real-time display, if dust concentration exceeds the standard time will trigger the early warning mechanism. Finally, the remote monitoring of industrial dust emission detection function is realized.

Key words: Arduino; Dust concentration; GP2Y1014AU; ESP8266

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