传感技术学报
中国微米纳米技术学会
全国高校传感技术研究会 主办

面向水环境监测的无线传感器网络数据视频基站设计

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基金项目：

摘　要：

基于无线传感器网络的水环境监测系统包括数据监测节点、数据视频基站、远程监测中心等三部分，可对水温、PH值、浊度、电导率、溶解氧等水环境参数和重点区域的视频信息进行感知、采集、处理和传输，进而实现对水库、湿地、湖泊、江河、海洋等大范围水域的监测。数据视频基站在监测网络中充当数据监测节点和CDMA网络之间的网关，是整个系统的通信枢纽。本文研究了一种基于ARM-DSP双处理器架构的数据视频基站，并阐述了其硬件系统和软件系统设计。该基站采用ZigBee和CDMA无线传输技术，实现了基站与传感器网络、基站与远程监测中心的双向高效通信，满足了水环境远程实时监测系统的要求，在工业控制、智能家居、医疗监护、智能交通等领域亦具有广阔的应用前景。

关键词：水环境监测；数据视频基站；ARM-DSP双处理器；无线传输；视频信号采集

the Design of Data Video Base Station of WSNs Oriented Water Environment Monitoring

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Abstract:

Water environment monitoring system based on wireless sensor networks (WSNs) consists of three parts: data monitoring nodes, date video base station and remote monitoring center. For the sake of realizing to monitor large range waters such as reservoir, wetland, lake, river and ocean ,etc, the monitoring system has the function of perception, acquisition, processing and transmission to video-information in key areas and various water environment parameters, such as water temperature, PH, turbidity, electric conductivity, dissolved oxygen and so on. As the gateway between those data monitoring nodes and CDMA network, the data video base station is communication center in the monitoring network. Based on ARM-DSP double processors architecture, this paper researches the date video base station for the water environment monitoring system and offers the design of software and hardware of system. Moreover, by means of ZigBee and CDMA wireless transmission technology, the base station realizes data bidirectional communication between the base station and the sensor networks or the remote monitoring center. It well meets the need of remote real time water environment monitoring system and also has wide application prospect in industrial control, smart home, medical telemetry and intelligent traffic, etc.

Keywords: water environment monitoring; data video base station; ARM-DSP double processors; wireless transmission; video signal acquisition

投稿时间：**2010-04-27**

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