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Embedded FPGA solution for water quality monitoring system: Calibration and measurement(Conference Paper)

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Просмотр дополнительных организаций

Краткое описание

This paper presents a field operating water quality monitoring system based on real time controller and FPGA module. The system features functioning includes in-situ automatic cleaning and calibration of stand alone sensors such as turbidity, pH or conductivity, on-line measurement of water quality parameters using the calibrated sensors. In order to perform the above mentioned calibration and measurement tasks the system uses a set of centrifugal pumps and electrovalves and associated embedded control materialized by the LabVIEW programmed FPGA module. The voltages associated with water quality measurement channels are acquired using a four channels analog input module that work also under FPGA control. The data processing tasks are distributed between the FPGA module and the real-time controller included in the system. A practical approach concerning the sensor model implementation capabilities using the real-time controller (NI cRIO-9002) or FPGA (NI cRIO-9003) is also included. In order to provide the wireless remote control of the system an Ethernet - wireless bridge (IEEE802.11g) and client-server TCP software developed in LabVIEW were included in the system. A PDA based remote control solution was also implemented to evaluate system performance.

Актуальность темы SciVal

Тема: Thermistors | Signal Conditioning Circuits | Thermocouples

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Ключевые слова автора

Calibration control | Real-time processing | Reconfigurable measuring system

Включенные в указатель ключевые слова

Engineering uncontrolled terms: Analog inputs | Automatic cleaning | Client server | Electro-valves | Embedded control | Embedded FPGA | Four-channel | FPGA control | IEEE 802.11g | In-situ | LabViEW | Measuring systems | On-line measurement | Re-configurable | Real-time controllers | Realtime processing | Sensor model | Stand -alone | System features | System use | Water quality measurement | Water quality monitoring systems | Water quality parameters | Wireless bridges | Wireless remote control

Engineering controlled terms: Calibration | Centrifugal pumps | Computer programming languages | Controllers | Data processing | Hydraulic machinery | Information science | Measurement theory | Pumps | Remote control | Robotics | Sensors | Transmission control protocol | Turbidity | Water pollution | Water quality

Engineering main heading: Monitoring

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