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Multi-sensing node architecture for water quality monitoring

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Título Revista Instrumentation Viewpoint		Ano 2011
Língua Inglês	País Espanha	Mais Informação Visitar Link (http://upcommons.upc.edu/handle/209)

Abstract/Resumo

This work presents a multi-sensing node architecture designed and implemented for water quality (WQ) assessment. Each measuring node includes temperature, conductivity and turbidity sensing channels. Particular design of the sensing devices and of the system's base station software, as well as the periodic calibration of the sensors followed by upgrading of voltage to water quality conversion algorithms through the data stored on a SDcard assure high measurement accuracy. Using a 2XRS232 to Ethernet converter and an Ethernet bridge, the data from the WQ measurement node and the node localization, delivered by a GPS unit, are wirelessly transmitted to the base station. Embedded software was developed for the PIC18F4520 microcontroller using the MPLAB C18 Compiler from Microchip to implement data acquisition, SD card data reading, primary processing, and data communication. Additional LabVIEW software implemented at the base station level includes data communication, data logging and graphical representation of the WQ data from selected monitoring nodes.

Agradecimentos/Acknowledgements

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Palavras-chave

Water quality monitoring, Embedded systems, Conductivity, Turbidity, Temperature, Geographic information system

Identificadores da Publicação

ISSN (fonte: Externo)	1697-2562
Outro ID (fonte: Externo)	cv-prod-id-1821651
ID Ciência-IUL	ci-pub-9021

Outros Detalhes da Publicação

Ano Publicação Online	2011	
Editora	Universitat Politècnica de Catalunya	
Indexação	--	
ISSN	1697-2562 (/journals/1697-2562) (print) 1697-2562 (/journals/1697-2562) (online)	
ISBN	--	
Factor de Impacto	--	
Volume	Número	11
Série		
Número Artigo	--	
Páginas	66 - 67	
Avaliado Cientificamente	Sim	
Meio de Divulgação	Ambos (impresso e digital)	
Data Publicação (online)		
Data Publicação (print)		