

عنوان مقاله:

Study on Health Monitoring of Concrete Structures Using Wireless Sensor Networks

محل انتشار:

مجله سیستم های برق و سیگنال, دوره 3, شماره 1 (سال: 1394)

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خلاصه مقاله:

In this study, a system for monitoring the structural health of bridge deck and predicting various possible damages to this section was designed based on measuring the temperature and humidity with the use of wireless sensor networks then it was implemented and investigated. This paper also presents the experimental development of an automatic wireless sensor monitoring system for concrete structures. The objective is to provide a solution to measure both temperature and humidity inside a concrete structure. The research has been focused in the early age and curing phase period. Four solutions have been addressed. The first one involves the use of a negative temperature coefficient thermistor and an IRIS mote allowing for the creation of an IEEE 802.15.4 network. The second one considers the use of the SHT15 sensor, together with the PIC18F4680 microcontroller or the Arduino platform. The third solution involves the use of the SHT21S sensor and the eZ430-RF2500 wireless development tool platform for the MSP430 microcontroller. Finally, the fourth solution considers both the SHT15 and SHT21S sensors completely shielded allowing for the creation of a long-term solution. The potential of applying the proposed inexpensive wireless .sensor network approach is completely investigated and verified

کلمات کلیدی:

Structural health monitoring, wireless sensor networks, concrete, sensor, temperature, humidity

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