

Invocon Structural Health Monitoring Using a Remote Smart Telemetry Data Acquisition Network

Invocon, Inc. has designed a static, wireless data acquisition and communications network entitled INVONET. for use as an experimentation tool to evaluate the performance of bridge structures under transient loads. The network uses two-way radio frequency (RF) spread spectrum communications between distributed nodes or units and a central collection unit. Data to measure stress/strain, vibration, and temperature are collected from distributed sensor nodes on a bridge structure and transmitted to one or more central positions using up to 40 channels. An artificial intelligence network control imbedded in the system software allows network installation without operator intervention or specialized training. Each node operates on low power from batteries and enables 26 hours of operation. INVONET will collect cumulative load data as well as data caused by calibration trucks or normal traffic.

The INVONET wireless network concept can be adapted to any application that needs wide area data collection. This system is a smart network that establishes its own protocol and routes messages by finding the best communications path, since each node in the system acts as a relay, thus eliminating the need for every node to have a direct line-of-sight to the central communications node.

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