



SmartDiagnostics[®] Application Note Introduction to DARTwireless[™]

Publication Date: May 4, 2015

KCF Technologies, Inc.

Overview

The SmartDiagnostics[®] wireless network is an easy to install, end-to-end machine health monitoring solution. The network enables quick setup, low cost installation, flexibility to reconfigure and expand the network, and the ability to locate nodes in difficult to access areas. The wireless network uses the DARTwireless[™] protocol to communicate between the sensor nodes and wireless receivers. This application note briefly describes DARTwireless[™] and its key characteristics.



Give Your Machines a Voice



DART™ Wireless

KCF's DARTwireless™ Deterministic, Agile, Robust, Trustworthy wireless platform is a proprietary, local (local to a facility), ultra-low power (battery powered), industrial wireless solution that includes a wireless module and protocol stack. DART™ Wireless is designed for uses in applications such as Structural Health Monitoring (SHM), machinery Condition-Based Maintenance (CBM), environmental monitoring, manufacturing process monitoring, and non-safety critical control.

The key aspects of the DART™ Wireless network are the interference mitigation, network adaptation, and node joining/association techniques which are linked in cohesive behavior. The solution uses tailoring of the wireless data rate, efficient data packetization, and low power data assurance methods to lower power consumption without compromising network data throughput, responsiveness, or reliability. Through optimization and targeted design, the DARTwireless™ transceiver is fundamentally 8X more power efficient than typical IEEE 802.15.4 solutions.

DART™ wireless has the following characteristics:

- Modulation – GFSK (same as Bluetooth®)
- Over the air rate - 2 Mbps
- Frequency channels – 2429, 2436, 2443, 2450, 2457 MHz
- Channel half-power bandwidth – 2 MHz
- RF Channel bandwidth consumed – 0.8% Best case, 5.7% worst case*
- Peak RF power – 15 dBm
- Typical range: 800' line-of-site, 100-300' industrial indoor

* 100 sensors, 10 minute burst acquisition interval, 1650 samples per burst