CUBIC

Cubic Global Tracking Solutions mist™ Mesh Networking Technology, employs Texas Instruments Incorporated's CC2530 system-on-chip (SoC) hardware to help the Army Monitor Thousands of Vehicles

Imagine the enormity of having to track thousands of vehicles across a vast distance at four different bases in the Kuwait desert. This is the challenge the U.S. Army faces as the drawdown in Iraq brings thousands of assets in for cleaning, sorting, and inventory. In order to support the Army's complex business processes in this massive ongoing undertaking, Cubic Global Tracking Solutions provides a service called Army Mobility Asset Tracking System (AMATS) enabled by mist™ Mesh Network Technology.

Real World Application

The Cubic Global Tracking Solutions wireless mesh technology is deployed at the four Army Wash Racks in Kuwait for tracking of military vehicles as they are being washed, prepped and readied for redeployment from Iraq.

The Army refers to this logistics intelligence system as the Army Mobility Asset Tracking System (AMATS). Cubic Global Tracking Solutions mist™ technology is the foundation of the AMATS system. Cubic's small, battery-powered Mesh Asset Tag (MAT) devices with GPS receivers are attached to vehicles and automatically connect wirelessly with one another to form a wireless mesh network. The precise location of any military vehicle is automatically sent via the mesh Cubic Global Tracking Solution Device Management Center (DMC) whenever a vehicle moves or stops. The DMC provides a central database of all tags in operation and is searchable by asset or business process information. In addition, the DMC sends relevant location information to other business process systems using standard XML feeds.

Cubic Global Tracking mist™ mesh technology is the basis for the Army Mobility Asset Tracking System (AMATS), and it differs from others on the market because:

- The system was designed to meet the Army's advanced security Information Assurance (IA) standards. In comparison to RFID technology, which has seven waivers in place at the Pentagon, Cubic Global Tracking Solutions mist™ mesh technology does not require any waivers to operate.

- AMATS coverage is continuous vs. RFID which is limited to choke point reads by an interrogator.

- Built-in motion sensors and GPS gives the latitude and longitude location within 20 to 30 feet within the yard, which helps to locate the asset in the yard and mitigates property loss.

- The system enables business process analysis because it records time equipment is at a specific location in minutes, which can streamline and improve the processing of vehicles at a Wash Rack.

- The tag to tag mesh communications allows deployment with very little infrastructure, which provides massive savings to the customer. For instance, complete visibility over 70 acres and thousands of assets is being provided using only four mist™ mesh network gateways at Camp Arifjan.

- The mist™ Mesh Asset Tags only communicate with authorized and authenticated devices which prevents their use as Improvised Explosive Device (IED) triggers.

- The system also implements pervasive power management which allows tags to operate for years and eliminates situations where a tag exhausts its battery responding to non-productive RFID reads.

The Backbone of the Solution

With mist™ mesh networking technology, active RFID-like devices talk to each other while maintaining RFID ad-hoc characteristics, low power, and low cost. In addition to solving several profound RFID problems, Cubic GTS also delivers superior mesh networking capability through:

- **Ground-breaking scalability:** up to 6,700 nodes per gateway physically tested. Virtually no theoretical limit. 250 - Hop limit. 8 byte flat addresses space.

- **Contention threshold in one RF space is up to 5,000 nodes.**

- **Ad-hoc, dynamic network support with 4 minutes maximum join time.** Typically 20 seconds.

- **All Cubic GTS mist™ mesh devices are low power routers.** Power consumption <1mW. Predictable power profile = guaranteed minimum battery life.

- **FIPS140-2 compliant security.** Eliminates the need for Information Assurance waivers and/or policy exceptions for wireless communications.

- **Cubic GTS devices and communications are FIPS secure, assuring authenticity and data integrity.** Secure link layer prevents eavesdropping and replay attacks. Secure presentation layer prevents forwarders' access to data content.

- **Any-to-any routing.** Gateway to node, node to gateway, and node to node. Supports unicast, broadcast, multicast and geocast.

- **Full gateway redundancy.** No limit on number of simultaneous gateways. Gateway priorities. Any node can be a gateway for any period of time. <2mW ultra-low power gateways.

- **99.9% data reliability.**

- **Zero-configuration.**

Beyond Yard Management

Currently, one of the primary applications for Cubic's mist™ mesh network technology is Yard Management for the U.S. Army. Cubic Global Tracking Solutions' mesh technology is equally applicable to commercial logistics, transportation, condition based maintenance, environmental monitoring, and security. Our solution can be used for any application that requires large-scale, secure, dynamic mesh networking deployments with minimal maintenance. Our technology relies on the Texas Instrument CC2530 system-on-chip (SoC), which successfully certified all crypto algorithms per strict FIPS requirements in conjunction with CC2530 crypto hardware. We are looking forward to offering mist™ licensing to 3rd parties on the CC2530 platform.

CUBIC

For more information about Cubic Global Tracking Solutions mist™ Mesh Networking Technology, contact: 850-872-7099.