VIMS Industry Partnership Committee Meeting

August 31, 2008
Oceana Sensor Technologies

• Business operations
  – Small business founded in 1995
    • Spun out of PCB Group
  – Located in Virginia Beach, VA
  – ISO 9001:2000 Certified

• Business focus
  – Commercial/industrial
    • Industrial sensors and Wireless e-Diagnostic® product sales
    • Commercialization of R&D initiatives
  – Government
    • Wireless sensor research and development
    • Machinery monitoring, diagnostics, and prognostics products
  – Wireless sensor modules
Open Architecture
“data point to bottom line”

• Government and industry moving from stovepipe, non-integrated solutions
  – Readiness and/or regulatory requirement are government “bottom line”
  – Conservation and productivity for industry

• Open systems
  – Integrated solutions
  – Common architecture framework for asset operational management
    • Operator Feedback
    • Maintenance Advisories
    • Enterprise Decision Support
  – Open standards
    • OPC, OSA-EAI and OSA-CBM
IEEE802.11b/g Wireless Sensor Electronic Module

- Flexible, small size, wireless, data acquisition platform for sensing applications
  - Based on wireless system on chip and a programmable signal converter
- Product overview
  - Size: 17mm x 39mm
  - Environmental: -40°C to +85°C
  - Overview:
    - 2 UARTS
    - 1 SPI Master, 1 SPI Slave
    - I2C interface
    - Up to 4 Analog inputs
      - Up to 100ksps/channel
      - 4 differential inputs with 16 bit resolution
    - Built in 512-tap programmable FIR – filter
    - FIPS140-2 Certified Encryption
    - IEEE1588 time synch
    - Advanced power-save options
- Reference Designs
  - Digital reference, low speed voltage reference, high speed signal reference, directly interfaced reference
Intelligent Component Health Monitor

- ICHM® 20/20 Specifications
  - Dynamic Channels (2 Channels)
    - 24-Bit ADC
    - 96 kHz Sampling (per channel)
    - 40 kHz Effective Bandwidth
    - 32-Bit Floating Point DSP
  - Static Channels (4 Channels)
    - 12-Bit ADC
    - 3Hz Sampling
  - NEMA 4 Enclosure and Connectors
  - Bluetooth® Wireless Technology
  - 120mm x 80mm x 50mm, <300 gm
Intelligent Component Health Monitor

ICHM® Next Generation

- 8 channel configurable
  - Dynamic channels: vibration, cylinder firing pressure
  - Static channels: pressure, temperature, flow, strain, environmental
- Wireless or wired to network
  - IP addressable
  - FIPS certification (encryption)
  - 802.11b; Bluetooth
- OSA-CBM compliant
  - Integration with enterprise systems
    - Health assessment, prognostics, advisory
    - Web based user display of state detection data
    - Open standard enterprise data integration
  - Data acquisition, data qualification, state detection

ICHM is a registered trademark of Oceana Sensor Technologies
Intelligent Component Health Monitor

PC Based User Software
- Standard DAQ Setup
- Displays and Records Dynamic and Static Data
- Data Can be Exported into Spreadsheets or Analytical Packages
- Storage of Data in ODBC Format
- Near Real-Time Display
- Alarm Thresholds

Alarming

Spectrum

Time Waveforms
Embedded diagnostics for Unmanned Systems

true autonomous mission execution

Mission Commander

Policy and Guidance

Mission Planning

Maintenance Planning and Repair Depots

Operator Command and Control Interface

Condition-based Operations

External Communication

Command and Control

ADAPT Module

Data Acquisition (Sensors)

Troubleshoot

Condition-based Maintenance
Structural Interrogator™

Corrosion and crack detection analysis
• Oceana Sensor
  – Directed ultrasonic sensor and ultrasonic sensor arrays
  – Data analysis hardware
    • ICHM® core functionality
    • Ultra High Speed Data Acquisition Module
      – FPGA w/ integrated DSP
      – Timing control, acquisition sequencing, FIFOs, algorithm processing
• Academic partner
  – William and Mary, Dr. Mark Hinders
• Product Functionality-
  – Corrosion detection, bonding monitoring, crack detection
  – Detect degrees of degradation
  – Monitor inaccessible structures
  – Weld inspection and NDE
  – Health assessment, prognostics, advisory
VIMS Opportunity With OST

• Networked Sensing Systems
  – Technology integration for enterprise solutions
  – Wireless sensing application
  – Remote sensing
  – Open standards application

• Equipment Asset Management and CBM
  – Diagnostic data infrastructure
  – Intelligent Component Health Monitor (ICHM®)
    • ICHM® 20/20
    • ICHM® Next Generation
  – Sensor design and application

• Corrosion and crack detection
  – Structural Interrogator™

• 802.11b/g Wireless Module for Embedded Systems
Oceana Sensor

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