Dynetics Open Architecture for Telemetry and Instrumentation Systems (OATIS)

The Open Architecture for Telemetry and Instrumentation Systems (OATIS) was developed by Dynetics for the System Simulation and Development Directorate (SSDD). OATIS is modular and designed to make, log, and transmit inertial and various other measurement to a ground station. It includes two subsystems:

**Airborne Payload**
- Airborne Control Unit (ACU)
- RF Modem and Blade Antenna
- C-MIGITS III GPS/INS and Antenna (optional)
- Smart Sensor Nodes (SSNs)

**Ground Station**
- Ground Station Server
- Control Panel
- Moving Map Display
- Real-Time Strip-Charts
- Configuration Editor

**OATIS has been installed in the following Unmanned Aircraft Systems (UAS):**
- Shadow – initial integration and partial mission capable (PMC) flights performed December 2006 at Redstone Arsenal (RSA). Range check flights (100km) performed at RSA in January 2007.
- Other – installed on a total of five vendor prototypes to collect independent measurements for aerial vehicle (AV) performance analysis.

**Data Acquisition**

The SSNs are a family of distributed data acquisition products responsible for signal measurement. These devices consist of modular components for signal conditioning, measurement, and communication.

A network of SSNs is connected to the ACU via a network cable in a daisy chain topology. The nodes are placed in the UAS in close proximity to the signals to be measured.

The distributed data acquisition architecture of OATIS simplifies installation and maintenance of test equipment by significantly reducing the amount of cable that must be routed through the airframe.

For More Information:
- Email: telemetry@dynetics.com
- Phone: 256.713.5060
- Website: www.dynetics.com
OATIS System Overview

Hardware System Overview

**Airborne Control Unit (ACU)**
- PC-104 stack
- Onboard logging: 16+ hrs
- Post-flight download via USB
- Backup battery (optional)
- Ethernet port
- 5.1 lbs (7.2 lbs w/ battery)

**Inertial Navigation System (INS)**
- C-MIGITS III from Systron Donner
- MEMS-based IMU
- 12-channel Jupiter GPS
- 1.7 lbs

**Smart Sensor Node (SSN)**
- 7 analog voltage channels
- Sample rate: 1 to 4 kHz
- CAN bus output and control
- 0.4 lb

**RF Modem**
- COTS Microhard MHX-920
- 900 MHz frequency hopping
- ~60-mile range with omni antennas
- 1 W output
- 0.8 lb

**Ground Station**
- COTS laptop (Windows XP)
- RF modem
- Omni antenna
- OATIS control panel software

Software System Overview

**Ground Station Server**
- Data link control
- Telemetry distribution via TCP/IP
- Telemetry logging

**Control Panel**
- Pre-flight initialization of INS
- Data link status and control
- GPS time display
- Log time remaining display

**Moving Map Display**
- FalconView based
- Real-time situational awareness
- Flight test planning
- Flight path verification

**Real-Time Strip-Charts**
- Real-time graphical display
- INS and analog data
- Calculated values (e.g., density altitude)
- In-flight monitoring

**Configuration Editor**
- Configuration of SSNs
- In-flight adjustment of logging rates
- User labels for measurement channels

**Real-Time Telemetry Client Library**
- Common client library for telemetry
- Rapid development of new clients
- Clients can be located anywhere on a TCP/IP network