

Atair Aerospace Network Module

A wireless, ad-hoc, self-healing mesh network system

Overview

Atair Aerospace, Inc. has developed a new stand-alone module that can be used to add networking capability to a wide variety of custom and off-the-shelf sensor packages. Atair's Network Module acts as a smart node in a dynamically created and configured **self-healing mesh network**. The network operates in a decentralized **masterless** mode, meaning that any module can enter or leave the network at any time and there is no central point of failure and control. This gives the network a great deal of flexibility and robustness. The modules synchronize themselves to the network using integrated GPS. Although the modules need to receive the GPS signal to initially synchronize with the network, once that has been achieved the modules can run without having to resynchronize with the GPS signal. In addition to timing information, the module can also deliver precise GPS based positioning information to the attached sensor package, or transmit that position information across the network.

Integration

Third-party sensor packages can be integrated with the Network Module using either RS232 in a packet based mode or an on-board 16-bit, 8-channel analog-to-digital converter (ADC). Discrete messages are communicated to and from the module over the RS232 line and these messages can then be transmitted to either the entire network or to individual modules in the network. The protocol for this communication is entirely customizable and field upgradable. In addition, an attached CompactFlash card can be used for data logging purposes.

Both custom and off-the-shelf solutions are available now.

Technical Specifications

Network Features:

- **Dynamically created wireless, self-healing, ad-hoc mesh network**
- **Masterless operation**
- Very quick network discovery and synchronization
- Time domain multiplexing to avoid network collisions
- Up to 240 unique transmitters (and infinite receivers)
- Packet based communication with 32-bit CRC checksum
- 900 MHz Spread Spectrum (other frequencies optionally available), 1 Watt (higher with amplifier), 115 kbps

Additional Features:

- Up to 60 mile range between individual modules
- Options for data encryption
- GPS Position / Timing information updated at 1 or 4Hz
- Easy third-party sensor integration using RS232 or on-board 8-channel ADC
- Low power consumption, < 2W
- Optional CompactFlash card (16MB - 4GB) for upgradable firmware and data logging

For more information, view our web site at www.atairaerospace.com