MICA2

WIRELESS MEASUREMENT SYSTEM

- 3rd Generation, Tiny, Wireless Smart Sensors
- TinyOS - Unprecedented Communications and Processing
- > 1Yr Battery Life on AA Batteries (Using Sleep Modes)
- Wireless Communications with Every Node as Router Capability
- 315, 433 or 868/916 MHz Multi-Channel Radio Transceiver
- Light, Temperature, RH, Barometric Pressure, Acceleration/Seismic, Acoustic, Magnetic, and other Sensors available

Applications

- Wireless Sensor Networks
- Security, Surveillance, and Force Protection
- Environmental Monitoring
- Large Scale Wireless Networks (1000+ points)
- Distributed Computing Platform

MICA2

The MICA2 Mote is a third generation mote module used for enabling low-power, wireless, sensor networks. The MICA2 Mote features several new improvements over the original MICA Mote. The following features make the MICA2 better suited to commercial deployment:

- 868/916MHz, 433 or 315MHz multi-channel transceiver with extended range
- TinyOS (TOS) Distributed Software Operating System v1.0 with improved networking stack and improved debugging features
- Support for wireless remote reprogramming
- Wide range of sensor boards and data acquisition add-on boards
- Compatible with MICA2DOT (MPR500) quarter-sized Mote

Processor and Radio Platform (MPR400CB):
The MPR400CB is based on the Atmel ATmega 128L. The ATmega 128L is a low-power microcontroller which runs TOS from its internal flash memory. Using TOS, a single processor board (MPR400CB) can be configured to run your sensor application/processing and the network/radio communications stack simultaneously. The MICA2 51-pin expansion connector supports Analog Inputs, Digital I/O, I2C, SPI, and UART interfaces. These interfaces make it easy to connect to a wide variety of external peripherals.

Sensor Boards:
Various sensor and data acquisition boards are available from Crossbow. These boards connect to the MICA2 through a surface mount 51-pin connector. Crossbow supplies the following sensor boards:

- MTS101CA Photocell/Thermistor/Proto and Experiment Board
- MTS300CA/MTS310CA Photocell, Thermistor, Microphone, Sounder, Magnetic (310 only), Acceleration (310 only)
- Contact Crossbow for information on other boards

TinyOS 1.0 is a small, open-source, energy efficient, software operating system developed by UC Berkeley which supports large scale, self-configuring sensor networks. The source code and software development tools are publicly available at: http://webs.cs.berkeley.edu/tos
Base Stations:
A base station allows the aggregation of sensor network data onto a PC or other computer platform. Any MICA2 node (MPR400CB) can function as a base station by plugging the MPR400CB processor/radio board into a standard PC interface board, known as the Mote Interface Board (MIB510CA). The MIB510CA provides a serial interface for RS-232 as well as a parallel port programming interface for the Motes.

Crossbow also offers a stand-alone gateway solution, the MICA-WEB for both TCP/IP-based Ethernet networks and serial networks.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>MOTE-KIT400</td>
<td>Multi-Channel Developer’s Kit (3X MPR400CB, 2X MTS300CA, 1X MIB510CA)</td>
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<tr>
<td>MOTE-KIT410</td>
<td>Multi-Channel Developer’s Kit (3X MPR410CB, 2X MTS300CA, 1X MIB510CA)</td>
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<tr>
<td>MOTE-KIT420</td>
<td>Multi-Channel Developer’s Kit (3X MPR420CB, 2X MTS300CA, 1X MIB510CA)</td>
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<tr>
<td>MPR400CB</td>
<td>868/916 MHz Processor/Radio Board</td>
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<td>MPR410CB</td>
<td>433 MHz Processor/Radio Board</td>
</tr>
<tr>
<td>MPR420CB</td>
<td>315 MHz Processor/Radio Board</td>
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<tr>
<td>MTS101CA</td>
<td>Light, Temp, and Prototype Sensor Board</td>
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<tr>
<td>MTS300CA</td>
<td>Light, Temp, Acoustic, and Sounder Sensor Board</td>
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<tr>
<td>MTS301CA</td>
<td>Same as MTS300CA but also includes Magnetic and Acceleration</td>
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<tr>
<td>MIB510CA</td>
<td>MICA, MICA2, MICA2DOT Mote Interface &amp; Programming Board</td>
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![MIB510CA Mote Interface Board](image)