

MICA2

WIRELESS MEASUREMENT SYSTEM

- 3rd Generation, Tiny, Wireless Platform for Smart Sensors
- Designed Specifically for Deeply Embedded Sensor Networks
- > 1 Year Battery Life on AA Batteries (Using Sleep Modes)
- Wireless Communications with Every Node as Router Capability
- 868/916 MHz Multi-Channel Radio Transceiver
- Expansion Connector for Light, Temperature, RH, Barometric Pressure, Acceleration/Seismic, Acoustic, Magnetic and other Crossbow Sensor Boards

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:

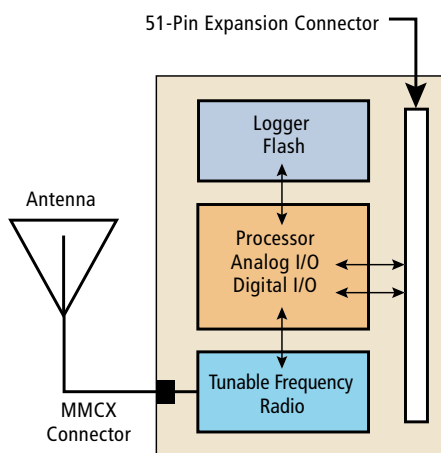
- 868/916 MHz multi-channel transceiver with extended range
- Supported by MoteWorks™ wireless sensor network platform for reliable, ad-hoc mesh networking
- Support for wireless remote reprogramming
- Wide range of sensor boards and data acquisition add-on boards

Processor and Radio Platform (MPR400)

The MPR400 is based on the Atmel ATmega128L. The ATmega128L is a low-power microcontroller which runs MoteWorks from its internal flash memory. A single processor board (MPR400) 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

Crossbow offers a variety of sensor and data acquisition boards for the MICA2 Mote. All of these boards connect to the MICA2 via the standard 51-pin expansion connector. Custom sensor and data acquisition boards are also available. Please contact Crossbow for additional information.



MPR400 Block Diagram

MoteWorks enables the development of custom sensor applications and is specifically optimized for low-power, battery-operated networks. MoteWorks is based on the open-source TinyOS operating system and provides reliable, ad-hoc mesh networking, over-the-air-programming capabilities, cross development tools, server middleware for enterprise network integration and client user interface for analysis and configuration.

Processor/Radio Board	MPR400CB	Remarks
Processor Performance		
Program Flash Memory	128K bytes	
Measurement (Serial) Flash	512K bytes	>100,000 Measurements
Configuration EEPROM	4K bytes	
Serial Communications	UART	0-3V transmission levels
Analog to Digital Converter	10 bit ADC	8 channel, 0-3V input
Other Interfaces	DIO,I2C,SPI	
Current Draw	8 mA	Active mode
	< 15 μ A	Sleep mode
Multi-Channel Radio		
Center Frequency	868/916 MHz	ISM bands
Number of Channels	4/ 50	Programmable, country specific
Data Rate	38.4 Kbaud	Manchester encoded
RF Power	-20 to +5 dBm	Programmable, typical
Receive Sensitivity	-98 dBm	Typical, analog RSSI at AD Ch. 0
Outdoor Range	500 ft	1/4 Wave dipole, line of sight
Current Draw	27 mA	Transmit with maximum power
	10 mA	Receive
	< 1 μ A	Sleep
Electromechanical		
Battery	2X AA batteries	Attached pack
External Power	2.7 - 3.3 V	Connector provided
User Interface	3 LEDs	User programmable
Size (in)	2.25 x 1.25 x 0.25	Excluding battery pack
(mm)	58 x 32 x 7	Excluding battery pack
Weight (oz)	0.7	Excluding batteries
(grams)	18	Excluding batteries
Expansion Connector	51-pin	All major I/O signals

Notes: Specifications subject to change without notice

Base Stations

A base station allows the aggregation of sensor network data onto a PC or other computer platform. Any MICA2 Mote can function as a base station when it is connected to a standard PC interface or gateway board. The MIB510/MIB520 provides a serial/USB interface for both programming and data communications. Crossbow also offers a stand-alone gateway solution, the MIB600 for TCP/IP-based Ethernet networks.



MIB520 Mote Interface Board

Ordering Information

Model	Description
WSN-START900CA	MICA2 Starter Kit 868/916 MHz
WSN-PRO900CA	MICA2 Professional Kit 868/916 MHz
MPR400CB	868/916 MHz Processor/Radio Board