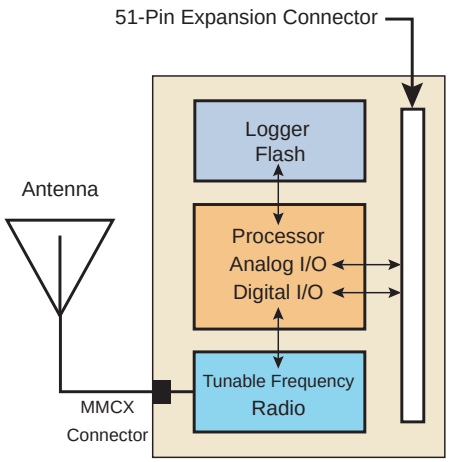
MICA2

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
- 315, 433 or 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



MPR400CB Block Diagram

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, 433 MHz or 315 MHz 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

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

Processor and Radio Platform (MPR400CB)

The MPR400CB is based on the Atmel ATmega128L. The ATmega128L 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

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.

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Processor/Radio Board	MPR400CB	MPR410CB	MPR420CB[1]	Remarks
Processor Performance				
Program Flash Memory	128K bytes	128K bytes	128K bytes	
Measurement (Serial) Flash	512K bytes	512K bytes	512K bytes	>100,000 Measurements
Configuration EEPROM	4K bytes	4K bytes	4K bytes	
Serial Communications	UART	UART	UART	0-3V transmission levels
Analog to Digital Converter	10 bit ADC	10 bit ADC	10 bit ADC	8 channel, 0-3V input
Other Interfaces	DIO,I2C,SPI	DIO,I2C,SPI	DIO,I2C,SPI	
Current Draw	8 mA	8 mA	8 mA	Active mode
	< 15 µA	< 15 µA	< 15 µA	Sleep mode
Multi-Channel Radio				
Center Frequency	868/916 MHz	433 MHz	315 MHz	ISM bands
Number of Channels	4/ 50	4	5	Programmable, country specific
Data Rate	38.4 Kbaud	38.4 Kbaud	38.4 Kbaud	Manchester encoded
RF Power	-20 to +5 dBm	-20 to + 10 dBm	-20 to + 10 dBm	Programmable, typical
Receive Sensitivty	-98 dBm	-101 dBm	-101 dBm	Typical, analog RSSI at AD Ch. 0
Outdoor Range	500 ft	1000 ft	1000 ft	1/4 Wave dipole, line of sight
Current Draw	27 mA	25 mA	25 mA	Transmit with maximum power
	10 mA	8 mA	8 mA	Receive
	< 1 µA	< 1 µA	< 1 µA	Sleep
Electromechanical				
Battery	2X AA batteries	2X AA batteries	2X AA batteries	Attached pack
External Power	2.7 - 3.3 V	2.7 - 3.3 V	2.7 - 3.3 V	Connector provided
User Interface	3 LEDs	3 LEDs	3 LEDs	User programmable
Size (in)	2.25 x 1.25 x 0.25	2.25 x 1.25 x 0.25	2.25 x 1.25 x 0.25	Excluding battery pack
(mm)	58 x 32 x 7	58 x 32 x 7	58 x 32 x 7	Excluding battery pack
Weight (oz)	0.7	0.7	0.7	Excluding batteries
(grams)	18	18	18	Excluding batteries
Expansion Connector	51-pin	51-pin	51-pin	All major I/O signals

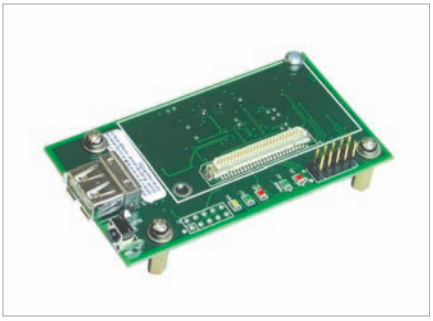
Notes:

[1]Certified under Japanese BIJAKU radio regulations

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 MIB510CA/MIB520CA provides a serial/USB interface for both programming and data communications. Crossbow also offers a stand-alone gateway solution, the MIB600CA for TCP/IP-based Ethernet networks.



MIB520CA Mote Interface Board

Ordering Information

Model	Description
MOTE-KIT400CC	868/916 MHz Multi-Channel Developer's Kit (3x MPR400CB, 2x MTS300CA, 1x MIB510CA)
MOTE-KIT410CC	433 MHz Multi-Channel Developer's Kit (3x MPR410CB, 2x MTS300CA, 1x MIB510CA)
MOTE-KIT420CD	315 MHz Multi-Channel Developer's Kit (3x MPR420CB, 2x MTS300CA, 1x MIB510CA)
MPR400CB	868/916 MHz Processor/Radio Board
MPR410CB	433 MHz Processor/Radio Board
MPR420CB	315 MHz Processor/Radio Board

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