

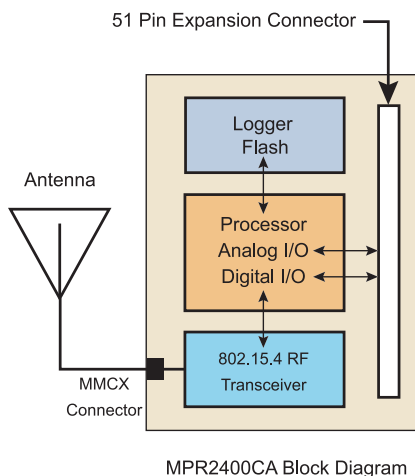
MICAz

WIRELESS MEASUREMENT SYSTEM

- ▼ IEEE 802.15.4, Tiny, Wireless Measurement System
- ▼ Designed Specifically for Deeply Embedded Sensor Networks
- ▼ 250 kbps, High Data Rate Radio
- ▼ Wireless Communications with Every Node as Router Capability
- ▼ Expansion Connector for Light, Temperature, RH, Barometric Pressure, Acceleration/Seismic, Acoustic, Magnetic, and other Crossbow Sensor Boards

Applications

- ▼ Indoor Building Monitoring and Security
- ▼ Acoustic, Video, Vibration, and Other High Speed Sensor Data
- ▼ Large Scale Sensor Networks (1000+ Points)
- ▼ ZigBee Compliant Systems and Sensors



MICAz

The MICAz is a 2.4GHz, IEEE 802.15.4 compliant, Mote module used for enabling low-power, wireless, sensor networks. The MICAz Mote features several new capabilities that enhance the overall functionality of Crossbow's MICA family of wireless sensor networking products. These features include:

- IEEE 802.15.4/ZigBee compliant RF transceiver
- 2.4 to 2.4835 GHz, a globally compatible ISM band
- Direct sequence spread spectrum radio which is resistant to RF interference and provides inherent data security
- 250 kbps data rate
- Runs TinyOS 1.1.7 and higher, including Crossbow's reliable mesh networking stack software modules
- Plug and play with all of Crossbow's sensor boards, data acquisition boards, gateways, and software

TinyOS 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 software development tools are publicly available at:

<http://webs.cs.berkeley.edu/tos>

Processor and Radio Platform (MPR2400CA):

Using TOS, a single processor board (MPR2400CA) can be configured to run your sensor application/processing and the mesh networking radio stack simultaneously. The MICAz IEEE 802.15.4 radio offers both high speed (250 kbps) and hardware security (AES-128). The MICAz 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:

In addition to the MTS101 and MTS300/310 series, Crossbow offers a variety of sensor and data acquisition boards for the MICAz Mote. All of these boards connect to the MICAz via the standard 51-pin expansion connector. Custom sensor and data acquisition boards are also available. Please contact Crossbow for additional information.

Processor/Radio Board	MPR2400CA	Remarks
Processor Performance		
Program Flash Memory	128K bytes	
Measurement Serial Flash	512K bytes	>100,000 measurements
Configuration EEPROM	4 K bytes	
Serial Communications	UART	0 V to 3 V transmission levels
Analog to Digital Converter	10 bit ADC	8 channels, 0 V to 3 V input
Other Interfaces	Digital I/O,I2C,SPI	
Current Draw	8 mA	Active mode
	< 15uA	Sleep mode
RF Transceiver		
Frequency band ¹	2400 MHz to 2483.5 MHz	ISM band, programmable in 1 MHz steps
Transmit (TX) data rate	250 kbps	
RF power	-24 dBm to 0 dBm	
Receive Sensitivity	-90 dBm (min), -94 dBm (typ)	
Adjacent channel rejection	47 dB	+ 5 MHz channel spacing
	38 dB	- 5 MHz channel spacing
Outdoor Range	75 m to 100 m	1/2 wave dipole antenna, LOS
Indoor Range	20 m to 30 m	1/2 wave dipole antenna
Current Draw	19.7 mA	Receive mode
	11 mA	TX, -10 dBm
	14 uA	TX, -5 dBm
	17.4 mA	TX, 0 dBm
	20 uA	Idle mode, voltage regular on
	1 uA	Sleep mode, voltage regulator off
Electromechanical		
Battery	2X AA batteries	Attached pack
External Power	2.7 V - 3.3 V	Molex connector provided
User Interface	3 LEDs	Red, green, and yellow
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

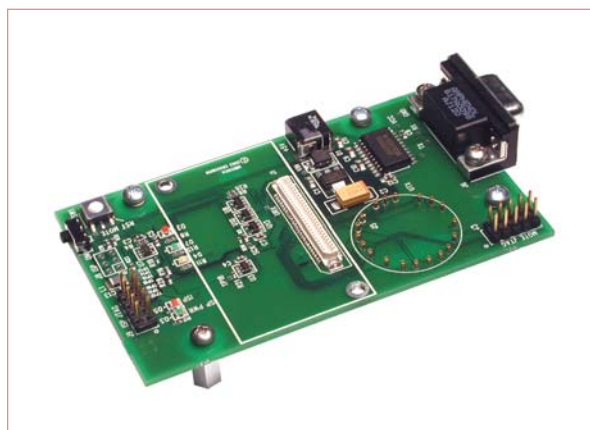
Notes

¹5 MHz steps for compliance with IEEE 802.15.4/D18-2003.
 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 MICAz Mote can function as a base station by plugging the MPR2400CA Processor/Radio Board into an MIB510CA serial interface board. The MIB510CA provides an RS-232 serial interface for both programming and data communications. Crossbow also offers a stand-alone gateway solution, the MIB600CA, for TCP/IP-based Ethernet networks.

▼ MIB510CA Mote Interface Board



Ordering Information

Model	Description
MOTE-KIT2400CB	MICAz Developer's Kit (8X MPR2400CA, 4X MTS310CA, 3X MTS300CA, 1X MDA300CA, 1X MIB600CA, 1X MIB510CA)
MPR2400CA	2.4 GHz Processor/Radio Board
MTS101CA	Light, Temp, and Prototype Sensor Board
MTS300CA	Light, Temp, Acoustic, and Sounder Sensor Board
MTS310CA	Same as MTS300CA but also includes Magnetic and Acceleration
MIB510CA	MICA, MICA2, MICA2DOT Mote Interface & Programming Board