

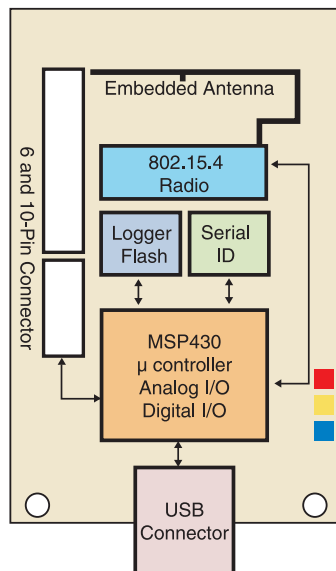
# TELOSB

## TELOSB MOTE PLATFORM

- IEEE 802.15.4 compliant
- 250 kbps, high data rate radio
- TI MSP430 microcontroller with 10kB RAM
- Integrated onboard antenna
- Data collection and programming via USB interface
- Open-source operating system
- Optional integrated temperature, light and humidity sensor

## Applications

- Platform for low power research development
- Wireless sensor network experimentation



TPR2400CA Block Diagram



## TELOSB

Crossbow's TelosB mote (TPR2400) is an open source platform designed to enable cutting-edge experimentation for the research community. The TPR2400 bundles all the essentials for lab studies into a single platform including: USB programming capability, an IEEE 802.15.4 radio with integrated antenna, a low-power MCU with extended memory and an optional sensor suite (TPR2420). TPR2400 offers many features, including:

- IEEE 802.15.4/ZigBee compliant RF transceiver
- 2.4 to 2.4835 GHz, a globally compatible ISM band
- 250 kbps data rate
- Integrated onboard antenna
- 8 MHz TI MSP430 microcontroller with 10kB RAM
- Low current consumption
- 1MB external flash for data logging
- Programming and data collection via USB
- Optional sensor suite including integrated light, temperature and humidity sensor (TPR2420)
- Runs TinyOS 1.1.10 or higher

The TelosB platform was developed and published to the research comm-

unity by UC Berkeley. This platform delivers low power consumption allowing for long battery life as well as fast wakeup from sleep state. Though the TPR2400 is an uncertified radio platform, it is fully compatible with the open-source TinyOS distribution.

TPR2400 is powered by two AA batteries. If the TPR2400 is plugged into the USB port for programming or communication, power is provided from the host computer. If the TPR2400 is always attached to the USB port no battery pack is needed.

TPR2400 provides users with the capability to interface with additional devices. The two expansion connectors and onboard jumpers may be configured to control analog sensors, digital peripherals and LCD displays.

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://www.tinyos.net>

Specifications	TPR2400CA	TPR2420CA	Remarks
<b>Module</b>			
Processor Performance	16-bit RISC	16-bit RISC	
Program Flash Memory	48K bytes	48K bytes	
Measurement Serial Flash	1024K bytes	1024K bytes	
RAM	10K bytes	10K bytes	
Configuration EEPROM	16K bytes	16K bytes	
Serial Communications	UART	UART	0-3V transmission levels
Analog to Digital Converter	12 bit ADC	12 bit ADC	8 channels, 0-3V input
Digital to Analog Converter	12 bit DAC	12 bit DAC	2 ports
Other Interfaces	Digital I/O,I2C,SPI	Digital I/O,I2C,SPI	
Current Draw	1.8 mA	1.8 mA	Active mode
	5.1 $\mu$ A	5.1 $\mu$ A	Sleep mode
<b>RF Transceiver</b>			
Frequency band <sup>1</sup>	2400 MHz to 2483.5 MHz	2400 MHz to 2483.5 MHz	ISM band
Transmit (TX) data rate	250 kbps	250 kbps	
RF power	-24 dBm to 0 dBm	-24 dBm to 0 dBm	
Receive Sensitivity	-90 dBm (min), -94 dBm (typ)	-90 dBm (min), -94 dBm (typ)	
Adjacent channel rejection	47 dB	47 dB	+ 5 MHz channel spacing
	38 dB	38 dB	- 5 MHz channel spacing
Outdoor Range	75 m to 100 m	75 m to 100 m	Inverted-F antenna
Indoor Range	20 m to 30 m	20 m to 30 m	Inverted-F antenna
Current Draw	23 mA	23 mA	Receive mode
	21 $\mu$ A	21 $\mu$ A	Idle mode
	1 $\mu$ A	1 $\mu$ A	Sleep mode
<b>Sensors</b>			
Visible Light Sensor Range		320 nm to 730 nm	Hamamatsu S1087
Visible to IR Sensor Range		320 nm to 1100nm	Hamamatsu S1087-01
Humidity Sensor Range		0-100% RH	Sensirion SHT11
Resolution		0.03% RH	
Accuracy		$\pm$ 3.5% RH	Absolute RH
Temperature Sensor Range		-40°C to 123.8°C	Sensirion SHT11
Resolution		0.01°C	
Accuracy		$\pm$ 0.5°C	@25°C
<b>Electromechanical</b>			
Battery	2X AA batteries	2X AA batteries	Attached pack
User Interface	USB	USB	v1.1 or higher
Size (in)	2.55 x 1.24 x 0.24	2.55 x 1.24 x 0.24	Excluding battery pack
(mm)	65 x 31 x 6	65 x 31 x 6	Excluding battery pack
Weight (oz)	0.8	0.8	Excluding batteries
(grams)	23	23	Excluding batteries

#### Notes

<sup>1</sup>Programmable in 1 MHz steps, 5 MHz steps for compliance with IEEE 802.15.4/D18-2003.  
Specifications subject to change without notice

## Ordering Information

Model	Description
TPR2400CA	IEEE 802.15.4 TelosB Mote
TPR2420CA	IEEE 802.15.4 TelosB Mote with Sensor Suite



TPR2420 with Sensor Suite

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