

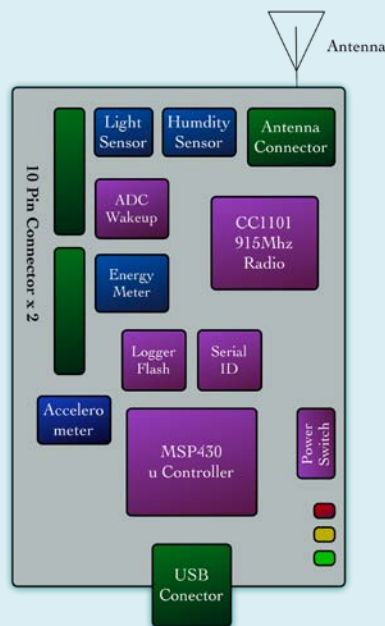
# TelosW

Ultra-Low-Power Sensor Mote with Wake-On

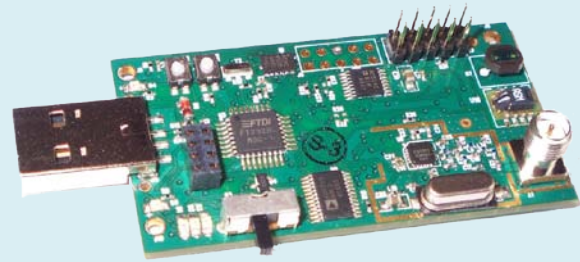
- 868-915MHz CC1101 wake-on radio with multiple data rates and multiple channels
- MSP430 ultra low power microcontroller
- Data collection and programming via USB interface
- Open-source Operating System
- Temperature and humidity sensor
- 3-Axis accelerometer and light sensor with wake-on mode
- Integrated energy meter

## Application

- Wireless Sensor Network
- Environmental Monitoring
- Security, Surveillance
- Asset tracking



**TelosW** is an ultra-low power platform for wireless sensor network. It supports USB programming and data collection, and JTAG debug. The ultra-low power microcontroller MSP430 can be waked on by either radio or sensor. The radio (CC1101) supports wake-on mode. TelosW has four kinds of sensors including light, humidity, temperature and



accelerometer sensor on board. The light and accelerometer sensors also have wake-on mode. TelosW has rich expansion support: two 10-pin expansion connectors including I2C, SPI, UART, GPIOs, 2-wakeup ADCs, 4 non-wakeup ADCs. The threshold of two wakeup ADC is programmable with 256 levels. The energy meter on board can record energy consumption in  $\mu\text{A}$  accuracy.

## Key Features

- Supply voltage 0.9-3.3V, ultra low energy consumption ( $6\mu\text{A}$  in sleep mode)
- Wake-on radio CC1101 with multiple data rate: 1.2kbps, 38.4kbps, 250kbps and 500kbps, and multiple channels in 868-915MHz range. Fast wakeup from sleep mode ( $240\mu\text{s}$ ).
- 8 MHz Texas Instrument MSP430 microcontrollers (10k RAM, 48k ROM). Fast wakeup from MCU sleep ( $<6\mu\text{s}$ )
- Integrated Humidity, Temperature, Light sensor and 3-Axis Accelerometer
- 1MB external flash for data logging
- 6 ADC (2 supports wake-on with threshold programmable), 1 DAC. ADC supports  $0\sim 2.5\text{V}$ ,  $0\sim 5\text{V}$ ,  $4\sim 20\text{mA}$  analog input
- Integrated energy meter with  $\mu\text{J}$  accuracy
- Support TinyOS, device driver compatible with TelosB
- 20-pin expansion support, SMA connector
- JTAG debug support
- USB Programming and data collection
- Power switch on board

Specification	TelosW	Remark
<b>Module</b>		
Processor Performance	16-bit RISC	
Program Flash Memory	48K bytes	
Measurement Serial(Flash)	1024K bytes	
RAM	10K bytes	
Configuration EEPROM	16K bytes	
Serial Communication	UART	0-3V transmission levels
Analog to Digital Converter	12-bit ADC	8 channels, 0-3V, 0-5V input
Digital to Analog Converter	12-bit DAC	2 port
Other interface	Digital I/O, I2C, SPI, UART	
<b>RF Transceiver</b>		
Frequency band	868-915 MHz	ISM band
Data rate	1.2k/38.4k/250k/500kbps	
RF power	-30dBm ~ 10dBm	
Receive Sensitivity	-111	915MHz, 1.2kbps
	-103	915MHz, 38.4kbps
	-94	915MHz, 250kbps
	-87	915MHz, 500kbps
Wakeup time	240μS	
Outdoor Range	600ft	¼" wave dipole, line of sight
Current Draw	14.7mA	Receive mode, 1.2kbps
	14.6mA	Receive mode, 38.4kbps
	15.6mA	Receive mode, 250kbps
	32.3mA	Transmit mode, 10dBm
	16.8mA	Transmit mode, 0dBm
	13.1mA	Transmit mode, -6dBm
	1.7mA	Idle mode
	400nA	Sleep mode
<b>Sensor</b>		
Visible Light Sensor Range	320nm to 730 nm	Hamamatsu S1087
Humidity Sensor Range	0-100% RH	Sensirion SHT11
Resolution	0.03% RH	
Accuracy	±3.5% RH	Absolute RH
Temperature Sensor Range	-40 °C to 123.8 °C	Sensirion SHT11
Resolution	0.01°C	
Accuracy	±0.5 °C	@25 °C
3-Axis Accelerometer Range	±16g, ±8g, ±4g, ±2g	ADXL345
Resolution	4mg/LSB	
Energy Meter Resolution	1uJ	
<b>Electromechanical</b>		

Battery	2xAA batteries	Attached pack
External Power	3.3V	Connector provided
User interface	3 LEDs, 2 Buttons	User programmable
Size (inch)	2.50 x 1.33 x 0.24	Excluding battery pack
Weight	0.8 oz	
Expansion Connector		
Digital Connector	I2C, UART, SPI, GPIO	
Analog Connector	0~2.5V, 0~5V, 0-20mA	
ADC type	2 wakeup ADC 4 normal ADC	

Expansion Connector Definition of TelosW **(the upper connector is closer to USB)**

