

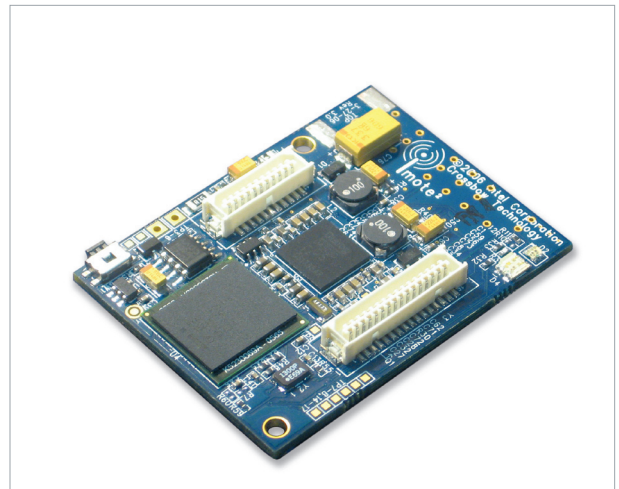
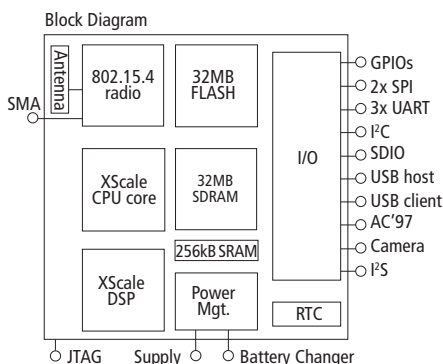
Imote2

HIGH-PERFORMANCE WIRELESS SENSOR NETWORK NODE

- Marvell PXA271 XScale® Processor at 13 – 416MHz
- Marvell Wireless MMX DSP Coprocessor
- 256kB SRAM, 32MB FLASH, 32MB SDRAM
- Integrated 802.15.4 Radio
- Integrated 2.4GHz Antenna, Optional External SMA Connector
- Multi-color Status Indicator LED
- USB Client With On-board mini-B Connector and Host Adapters
- Rich Set of Standard I/O: 3xUART, 2xSPI, I²C, SDIO, GPIOs
- Application Specific I/O: I²S, AC97, Camera Chip Interface, JTAG
- Compact Size: 36mm x 48mm x 9mm

Applications

- Digital Image Processing
- Condition Based Maintenance
- Industrial Monitoring and Analysis
- Seismic and Vibration Monitoring



Imote2

The Imote2 is an advanced wireless sensor node platform. It is built around the low-power PXA271 XScale CPU and also integrates an 802.15.4 compliant radio. The design is modular and stackable with interface connectors for expansion boards on both the top and bottom sides. The top connectors provide a standard set of I/O signals for basic expansion boards. The bottom connectors provide additional high-speed interfaces for application specific I/O. A battery board supplying system power can be connected to either side.

Processor

The Imote2 contains the Marvell PXA271 CPU. This processor can operate in a low voltage (0.85V), low frequency (13MHz) mode, hence enabling very low power operation. The frequency can be scaled from 13MHz to 416MHz with Dynamic Voltage Scaling. The processor has a number of different low power modes such as sleep and deep sleep. The PXA271 is a multi-chip module that includes three chips in a single package, the CPU with 256kB SRAM, 32MB SDRAM and 32MB of FLASH memory. It integrates many I/O options making it extremely flexible in supporting different sensors, A/Ds, radios, etc. These I/O features include I²C, 2 Synchronous Serial Ports (SPI) one of which is dedicated to the radio, 3 high speed UARTs, GPIOs, SDIO, USB client and host, AC97 and I²S audio codec interfaces, a fast infrared port, PWM, a Camera Interface and a high speed bus (Mobile Scaleable Link).

The processor also supports numerous timers as well as a real time clock. The PXA271 includes a wireless MMX coprocessor to accelerate multimedia operations. It adds 30 new media processor (DSP) instructions, support for alignment and video operations and compatibility with Intel MMX and SSE integer instructions. For more information on the PXA271, please refer to the Marvell datasheet.

Radio & Antenna

The Imote2 uses the CC2420 IEEE 802.15.4 radio transceiver from Texas Instruments. The CC2420 supports a 250kb/s data rate with 16 channels in the 2.4GHz band.

The Imote2 platform integrates a 2.4GHz surface mount antenna which provides a nominal range of about 30 meters. For longer range a SMA connector can be soldered directly to the board to connect to an external antenna.

Power Supply

The Imote2 can be powered by various means:

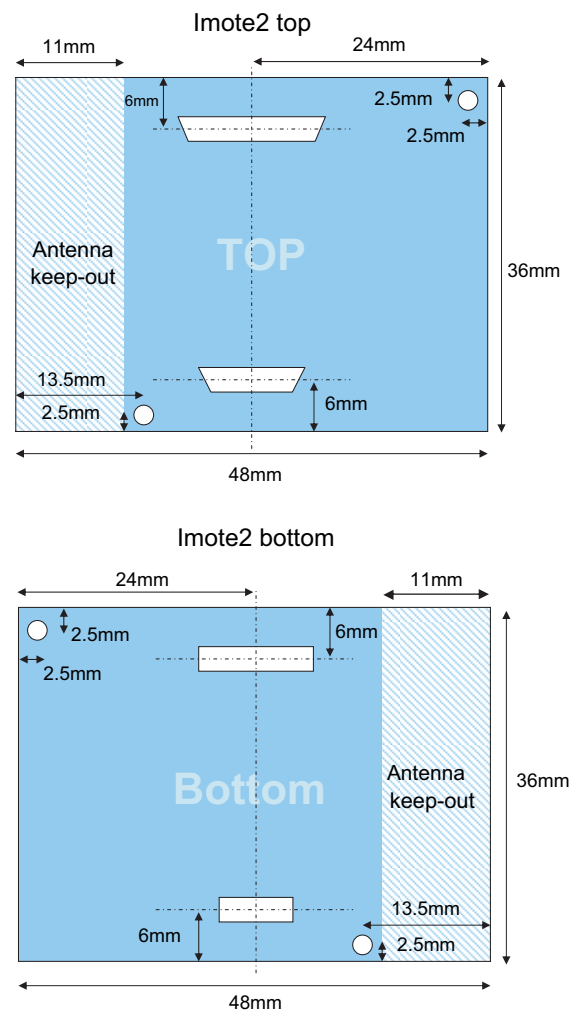
Primary Battery: This is typically accomplished by attaching a MEMSIC Imote2 Battery Board to either the basic or advanced connectors.

Rechargeable Battery: This requires a specially configured battery board attached to either the basic or advanced connectors. The Imote2 has a built-in charger for Li-Ion or Li-Poly batteries.

USB: The Imote2 can be powered via the on-board mini-B USB connector. This mode can also be used to charge an attached battery.

Battery Pads: A suitable primary battery or other power source can be connected via a dedicated set of solder pads on the Imote2 board.

| Processor/Radio Board | IPR2400 | Remarks |
|--|---------------------|-------------------------|
| CPU | | |
| Processor | Marvell PXA271 | |
| SRAM Memory | 256 kB | |
| SDRAM Memory | 32MB | |
| FLASH Memory | 32MB | |
| POWER CONSUMPTION | | |
| Current Draw In Deep Sleep Mode | 390 μ A | |
| Current Draw In Active Mode | 31 mA | 13MHz, radio off |
| Current Draw In Active Mode | 44 mA | 13MHz, radio Tx/Rx |
| Current Draw In Active Mode | 66 mA | 104MHz, radio Tx/Rx |
| Radio | | |
| Transceiver | TI CC2420 | |
| Frequency Band (ISM) | 2400.0 – 2483.5 MHz | |
| Data Rate | 250 kb/s | |
| Tx Power | -24 – 0 dBm | |
| Rx Sensitivity | -94 dBm | |
| Range (line of sight) | ~30 m | With integrated antenna |
| I/O | | |
| USB Client (mini-B), USB Host | | |
| UART 3x, GPIOs, I ² C, SDIO, SPI 2x, I ² S, AC97, Camera | | |
| Power | | |
| Battery Board | 3x AAA | |
| USB Voltage | 5.0 V | |
| Battery Voltage | 3.2 – 4.5 V | |
| Li-Ion Battery Charger | | |
| Mechanical | | |
| Dimensions Imote2 Board | 36mm x 48mm x 9mm | |
| Weight | 12g | |



Imote2 design licensed from Intel® Corporation.

Imote2 Battery Board

The universal battery board is designed to power the Imote2 using 3 primary AAA cells. Alternatively, rechargeable cells such as AAA NiMH can be used if charged separately.

The battery board can accommodate a plugged-in Imote2 via either the basic connectors (top) or the advanced connectors (bottom).

A mechanical switch on the side provides manual power shut-off. The battery board is fused for 500mA maximum current.



| Battery Board | IBB2400CA |
|-----------------------------|--------------------|
| Batteries | 3x AAA |
| Maximum Current | 500mA Fused |
| Size | 52mm x 43mm x 18mm |
| Weight with 3 AAA Batteries | 51g |
| Weight without Batteries | 14g |

Imote2 Third Party Software

Several operating systems are available for Imote2 including TinyOS, Linux and SOS. Additional system software is available from Open Source.

For the latest operating systems and additional third party accessories please visit www.memsic.com.

Ordering Information

| Model | Description |
|-----------|--|
| IPR2400CA | Imote2 Board plus the Battery Board (included) |
| IBB2400CA | Imote2 Battery Board (stand-alone) |
| IIB2400CA | Imote2 Interface Board |

