

Sensor Network Platform Kit (SNPK)

Jan Beutel, ETH Zurich

with Roman Lim, Mustafa Yücel and the MICS team



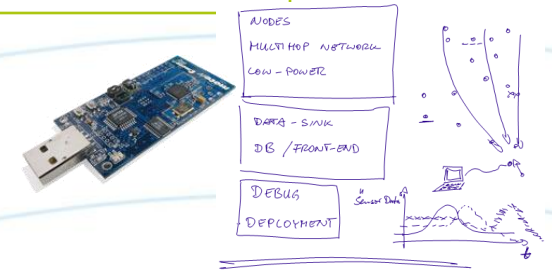
About the Sensor Network Platform Kit

- To make current state-of-the-art technology really workable for practitioners.
- Enabling a quick launch of new sensor applications, including web/database interfacing and testing.
- Targeting “standard environmental-monitoring” applications.
- Approach
 - Components that are state-of-the-art and known-to-work
 - Combines industry technology with know-how and reliable research prototypes
 - Public, opensource solution
- Born out of the need of many partner projects within MICS.

Sensor Network Platform Kit – Components

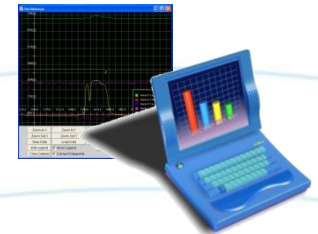
1. Low-Power Wireless Sensor Network

- TinyOS-2.x
- MSP430 based motes (Tmote Sky, TinyNode)
- General purpose data gathering application (LPL, CTP, dissemination, deluge...)
- Ultra-low power – low duty-cycle data gathering (Dozer)



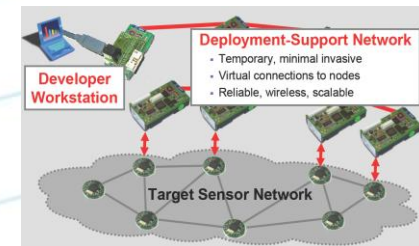
2. Backend Data Gathering

- Global Sensor Network (P2P database backend <http://gsn.sf.net>)



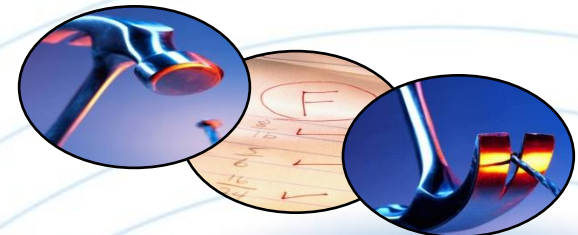
3. Testbed/Tools

- Deployment-Support Network
- Eclipse IDE for TinyOS



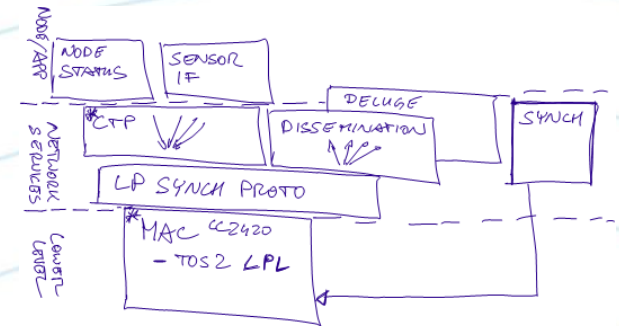
4. Technical support for MICS member projects

- Staffed support
- Testbed services
- Documentation and tools



Sensor Network Platform Kit – Status and Outlook

- Public availability
 - <http://www.btnode.ethz.ch> -> Sensor Network Platform Kit
 - tinyos-2.x-contrib/ethz
- Support team started in December 2006 (2 technical staff + students)
 - Technology evaluation
 - Knowledge-base
 - Testbed setup and integration (DSNmonitor)
 - WSN application design (harvester)
- Started to work with three “customer” projects
- Feedback of the software to TinyOS-2.x in the future.



BTnodes - A Distributed Environment for Prototyping Ad Hoc Networks

Projects :: Sensor Network Museum

View Edit Print

Overview

- Features
- BTnode Products
- Support
- History and Team
- Links

Documentation

- Installation
- Tutorials
- BTnut API
- Hardware Reference
- TinyOS on BTnodes
- Tips and Tricks

Projects

- Jaws - Deployment Support (DSN)
- Sensor Network Museum
- NCCR-MICS WG2
- Smart Buildings

Development

- sourceforge.net
- Browse CVS
- BTnut Build Status

Wiki

- Search
- WikiSandbox
- Recent Changes

SNM - The Sensor Network Museum™

Hello to the sensor network museum. Here we want to store reference data and links for different platforms, have fun exploring.

This collections based on a wiki page. if you want to add or edit information, [mail us](#) about access to this wiki.

Sensor Networks Routing Protocols

- SPIN (Sensor Protocols for Information via Negotiation)
- Directed Diffusion
- Rumor Routing
- Q-RC (Routing with compression using Q-learning)
- Survey papers on routing

Sensor Networks MAC Layer Protocols

- S-MAC
- T-MAC
- B-MAC?
- P-MAC?
- Z-MAC?

Sensor Network Simulators

- The Network Simulator
- Omninet++?
- SHAWN
- SENSE
- QualNet
- GloMoSim

Sensor Network Hardware Systems

Tatiana Bokareva has already done quite a good job in her listing of current platforms is maintained by the Imperial C

- BTnode rev2
- BTnode rev3
- eyesFX
- Imote
- Imote2
- Mica
- Mica2

Museum™ - Particles

ECO Particles Devices

for rapid prototyping of Ubiquitous and Pervasive Ad-Hoc (Sensor) Networks, Wearable Computers, Intelligence Environments based on PIC



TinyNode 584


0 microcontroller and a Xerxes



The Sensor Network Museum™ - Tmote Sky

Manufacturer documentation: [Moteiv Tmote Sky](#)

Ultra low power IEEE 802.15.4 compliant wireless sensor module based on a TI MSP430 and Chipcon CC2420 radio. Also named Telos B.



2.4V (input range)

Batteries or 3 cells (flash programming)	1.7 V
Consumption ^b	0.195 mW
	6.3 mW
	48 mW
	186 mW
	330.7mW

Features

- TI MSP430F1611 microcontroller at 8 MHz
- 10k SRAM, 48k Flash + 1024k serial storage
- 250kbps 2.4 GHz Chipcon CC2420 IEEE 802.15.4 Wireless Transceiver
- On-board humidity, temperature and light sensors
- Ultra-low current consumption
- Fast wakeup from sleep (<6usec)
- Programming and interface via USB
- 16-pin expansion port
- 32x80 mm

Power Consumption - Typical Operation

	Tmote Sky ^a
Battery Supply	2xAA cells or USB
Minimum Vin	2.1 V (min. 2.7V during flash programming)
Battery Capacity	2900 mAh
Regulated Supply	internal linear regulator for CC2420 radio at 1.8V
uC sleep with timer on	0.0153 mW ^b
uC active, radio off	5.4 mW
uC active, radio idle listening	65.4 mW
uC active, radio TX/RX	58.5 mW
Max. Power (uC active, radio TX/RX + flash write)	69 mW

^a typical datasheet values as reported for the whole system (computed at 3.0V)

<http://www.btnode.ethz.ch>