



## WIRELESS SENSOR NETWORK SOLUTIONS

with Case Analysis of Asia Pac Market

August 2009

Advances in wireless networking, micro-fabrication and integration (for example, sensors and actuators manufactured using micro-electro mechanical system technology, or MEMS), and embedded microprocessors have enabled a new generation of massive-scale sensor networks suitable for a range of commercial and military applications. The technology promises to revolutionize the way we live, work, and interact with the physical environment.

This report provides the reader with an understanding of the various communication network methodologies and their evolution towards the sensor network arena with special focus on the cutting edge applications and technological breakthroughs. It includes sections focusing on the important challenges and technological drawbacks for the sensor networks giving detailed outlooks about the architecture and auto-configuration strategies involved in the networks.

Wireless sensor challenges and the bottlenecks are evaluated relative to factors and scenarios that are of great importance and concern regarding deployment and performance.

This report evaluates the latest developments in the sensor network arena including tracking and monitoring applications. This report addresses all of the most important applications and uses today and those anticipated in the future.

For example, wireless sensor networks find a huge role in homeland security applications. The report analyzes opportunities in this area with special focus on key applications such as passport control, air defense systems and border security applications.

The report also includes case analysis of sensor networks in the Asia Pacific region focusing primarily on China, Singapore, Japan and also South Korea.

## TARGET AUDIENCE

- Wireless service providers including cellular mobile network operators and others
- Investors in the area of sensing, telemetry, remote monitoring and control
- Wireless component vendors and OEM manufacturers
- Application developers and systems integrators
- Wireless application and content providers

## ABOUT AUTHOR



Sanjay Chatterjee is an expert in ZigBee and Active RFID systems. He has developed Tracking solutions, Message Communication systems, Sensor Networks for environment sensing using ZigBee. He has successfully developed a rapidly deployable, self configurable, self healing Tracking System with Active RFID along with the GUI, and a handheld based active RFID reader/writer using the ZigBee protocol and transceiver.

**Section - I**

- \* Introduction

**Section - II**

- \* Evolution of Wireless Communication Networks

**Section -III**

- \* Important Challenges in Sensor Networks:
  - o Architecture of a Sensor Network and Beyond
  - o Self Configuration Techniques
  - o Data gathering procedure in a Sensor Network

**Section - IV**

- \* Synchronization Factors and Implementation Issues
  - o Synchronization Factors in a Sensor Network
  - o Synchronization Methodologies
- \* Mobile and Static Node Scenario
- \* Connection oriented and Connection less protocol
- \* Real-Life Implementation issues of a Sensor Network
  - o The Partitioning Decision
  - o Natural and Artificial Interferences
  - o Accuracy Factors
  - o Power Consumption issues

**Section - V**

- \* Sensor Networks in the Real World
  - o Hardware
  - o Environment
  - o Tools
  - o Simulators

**Section - VI**

- \* Current Areas of Adoption for the Sensor Network
  - o Current Application Areas for Sensor Networks
    - + Monitoring
    - + Tracking
    - + Transportation
    - + Communication

**Section - VII**

- \* Sensor Networks in Healthcare
  - o Healthcare and Sensor Networks
  - o Sensor Networks in Monitoring Patents and Elderly people
    - o Technical bottlenecks and challenges
      - + Improved sensor design
      - + Biocompatibility
      - + Energy Supply and Demand

**Section - VIII**

- \* Sensor Network and Smart Home
- \* Smart Home Basic Components
- \* Smart Home Standards
  - o X10
  - o Limitations of the standard
  - o Cost Estimation of the Available Technologies
  - o Budgeting and comparing device cost

**Section - IX**

- \* Quality of Service for Sensor Networks
- \* Quality Standards and Metrics
- \* Challenges ahead of QoS
- \* Factors & Scenarios influencing the QoS
- \* Steps against data uncertainty

**Section - X**

- \* Security Issues in Sensor Networks

- \* Implementing Secure Sensor Networks
- \* Using Sensor Networks for Security Measures
- \* Sensor Networks in Homeland Security
  - o Passport Control
  - o Border Security Application
  - o Air Defence System
  - o Environmental Monitor System
- \* Commercial Usages Targeting Factories
  - o Tracking
  - o Monitoring
  - o Inventory Control
  - o Automated Sales
  - o Process Control
- \* Products for Home

**Section - XI**

- \* Future of Sensor Networks and their Prototypes
  - o Asset and warehouse management
  - o Automotive
  - o Building monitoring and control
  - o Environmental Monitoring
  - o Healthcare
  - o Military Battlefield Awareness
  - o Security and surveillance
- \* Future Research
  - o Secure systems
  - o Embedded Operating Systems
  - o Group Management
  - o Lightweight Signal Processing
  - o High Data Rate Sensors

**Section XII**

- \* Sensor Network & Applications - Asia Pacific
  - o China
    - + Protocols and Standards
    - + Companies and Institutions Involved
    - + Present Status
    - + Roadmap of Technological Progress
    - + Future Potential
  - o Japan
    - + Protocols and Standards
    - + Companies and Institutions Involved
    - + Present Status
    - + Roadmap of Technological Progress
    - + Future Potential
  - o Singapore
    - + Protocols and Standards
    - + Companies and Institutions Involved
    - + Present Status
    - + Roadmap of Technological Progress
    - + Future Potential
  - o South Korea
    - + Protocols and Standards
    - + Companies and Institutions Involved
    - + Present Status
    - + Roadmap of Technological Progress
    - + Future Potential

**Section XIII**

- \* Conclusions

**Report Title**
**Wireless Sensor Network Solutions with Case Analysis of Asia Pac Market**
**License Type**
 Single User License ..... \$ **795 USD**
 Company License ... \$ **1,495 USD**
 Team License (2-5 People)... \$ **995 USD**
 Other Licensing Options: Inquire with Mind Commerce

**Family/Surname**
**First Name**
**Position**
**Company**
**Address**
**Country**
**Post Code**
**FAX**
**Telephone**
**Email**
**Order Type**

 Order by FAX at 1 877 646 3266

**Card Number**
**Expiration Date (MM/YY)**
**CV Code**
**Cardholder's Name**
**Signature**
**Billing Address**
**Country**
**Post Code**
**Signature**
**Date**
**Online Ordering**

Customers can order online by visiting report web page:

[http://www.mindcommerce.com/Publications/WSN\\_Soln\\_withAsiaPac2009.php](http://www.mindcommerce.com/Publications/WSN_Soln_withAsiaPac2009.php)
**Mind Commerce**

 300 CENTER Drive, Suite G-181 SU-  
 PERIOR CO 80027 (USA)

Tel/FAX: 1-877-MINDCOM (646-3266)

 Email: [info@mindcommerce.com](mailto:info@mindcommerce.com)