

Building Wireless Sensor Networks Using Arduino (Community Experience Distilled)

By Matthijs Kooijman

Leverage the powerful Arduino and XBee platforms to monitor and control your surroundings

About This Book

- Build your own low-power, wireless network using ready-made Arduino and XBee hardware
- Create a complex project using the Arduino prototyping platform
- A guide that explains the concepts and builds upon them with the help of examples to form projects

Who This Book Is For

This book is targeted at embedded system developers and hobbyists who have some working knowledge of Arduino and who wish to extend their projects using wireless connectivity.

What You Will Learn

- Interact with XBee boards using the XCTU program on Windows, OS X, or Linux
- Make your Arduino boards communicate wirelessly, using XBee modules in the advanced API mode
- Centrally collect and store measured sensor data, in the cloud or your own database
- Connect the coordinator Arduino to the Internet and send data to web services
- Control your environment automatically, based on sensor input from your network
- Interact with off-the-shelf ZigBee Home Automation devices
- Make your devices battery-powered and let them sleep to get months or even years of battery life

In Detail

Arduino has been established as the de facto standard microcontroller programming platform, being used for one-off do-it-yourself projects as well as prototypes for actual products. By providing a myriad of libraries, the Arduino community has made it very easy to interact with pretty much any piece of hardware out there. XBee offers a great range of low-power wireless solutions that are easy to work with, by taking all of the complexity of wireless (mesh) networking out of your hands and letting you focus on what to send without worrying about the how. Building wireless sensor networks is cost-effective as well as efficient as it will be done with Arduino support.

The book starts with a brief introduction to various wireless protocols, concepts, and the XBee hardware that enables their use. Then the book expands to explain the Arduino boards to you, letting them read and send sensor data, collect that data centrally, and then even control your home from the Internet. Moving further

more advanced topics such as interacting through the standard Zigbee Home Automation protocol, or making your application power-efficient are covered. By the end of the book, you will have all the tools needed to build complete, real-world solutions.

Style and approach

A hands-on guide, featuring a single home automation project that can be built as described or with endless variations. Every step is illustrated with complete examples and screenshots, allowing you to build the examples swiftly.

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About the Author

Matthijs Kooijman

Matthijs Kooijman is an independent embedded software developer who is firmly connected with the maker movement through a local fab lab and his work on the Arduino project. Since his youth, Matthijs has been interested in making things; for example, he built his first television remote control before the age of 10 (using a piece of rope to pull on the volume slider, not a solution that he would choose today). Matthijs has a firm belief in the merits of open source software and enjoys contributing to the software that he uses?both by coding and helping out other users. His work experience is broad?ranging from Web development to Linux driver hacking, from tech support to various forms of wireless networking, but almost always related to open source software in some way.

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