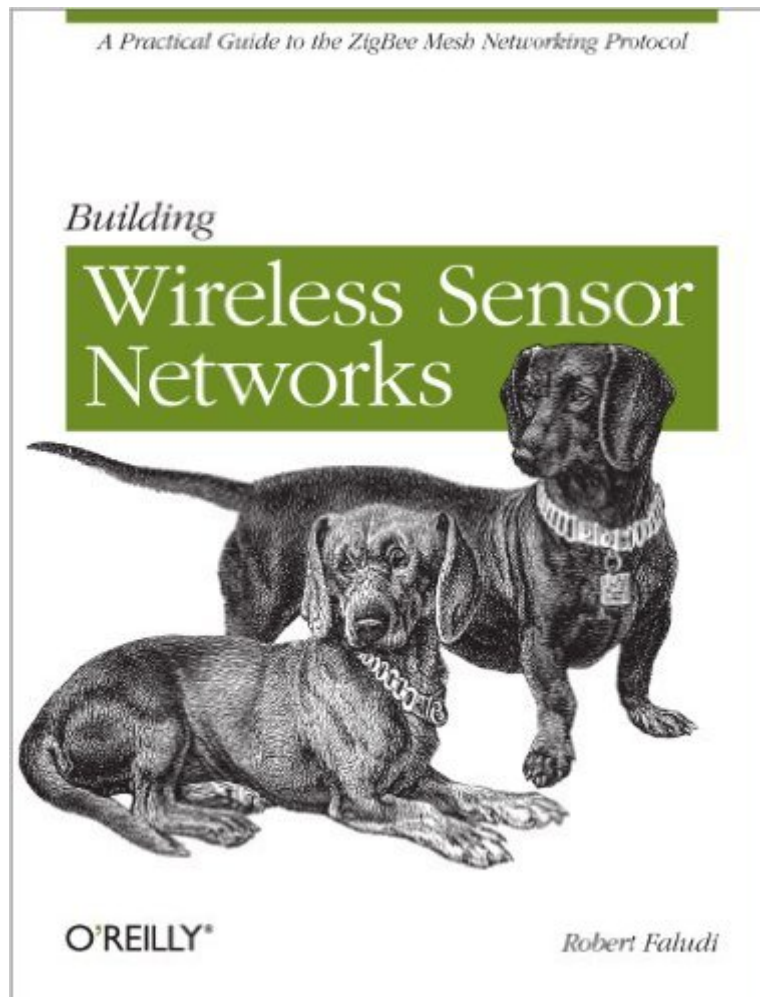


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# Building Wireless Sensor Networks: With ZigBee, XBee, Arduino, And Processing



## Synopsis

Get ready to create distributed sensor systems and intelligent interactive devices using the ZigBee wireless networking protocol and Series 2 XBee radios. By the time you're halfway through this fast-paced, hands-on guide, you'll have built a series of useful projects, including a complete ZigBee wireless network that delivers remotely sensed data. Radio networking is creating revolutions in volcano monitoring, performance art, clean energy, and consumer electronics. As you follow the examples in each chapter, you'll learn how to tackle inspiring projects of your own. This practical guide is ideal for inventors, hackers, crafters, students, hobbyists, and scientists. Investigate an assortment of practical and intriguing project ideas. Prep your ZigBee toolbox with an extensive shopping list of parts and programs. Create a simple, working ZigBee network with XBee radios in less than two hours -- for under \$100. Use the Arduino open source electronics prototyping platform to build a series of increasingly complex projects. Get familiar with XBee's API mode for creating sensor networks. Build fully scalable sensing and actuation systems with inexpensive components. Learn about power management, source routing, and other XBee technical nuances. Make gateways that connect with neighboring networks, including the Internet.

## Book Information

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## Customer Reviews

Faludi is kind to the reader by using simple language in the old school of:

tell-them-what-you're-going-to-say, tell-them and then tell-them-what-you-said. I bought the book because although I am not a beginner to electronics, I am to ZigBee, and I am lazy and want a quick start to what to get and why and which "start-bugs" to avoid. Faludi does a good job here and tries to please everybody by including non-Windows based (Mac and Linux) examples where he can (this market is clearly biased towards Windows). Evidently you could simply download the free ZigBee spec' and read it - it is not too boring and took me about four days to scan through it, but for the cheap price, I would recommend that even a professional would recover the cost in time saved from this book but evidently he will not be interested in the simplistic treatment of how to connect A to B, just the tips and hints and as a quick broad outline for both the spec and the parts range. For the beginner this book is excellent with both diagrams and photographs of how to wire up the half dozen-or-so connections between one module and another plus very full descriptions + screen shots of how to drive the (mainly Windows based) software. The firmware example-code is consistently of the simplest-only-to-do-the-principle (there is no cheating by padding with large amounts of code) and gradually the reader is taken into more and more detail about protocols and networking in a painless manner. A huge amount of work has gone into this book to make it look simple. It is also up to date (late 2010). I highly recommend it to anyone.

NYU Professor Robert Faludi, has supplied a very easy to follow book tackling the construction of a XBee wireless network, which is not as simple as it may appear. He provides both a step by step guide and a basic understanding/education of the technology involved. This book starts with describing initial choices around hardware and software to construct a XBee wireless network, Professor Faludi also does a quick tutorial on radio transmissions theory and wireless networking. Once you have the bits and pieces set out, Professor Faludi walks through a number of projects helping to build up the readers overall knowledge: 1. A Wireless doorbell 2. Romantic Lighting Sensor 3. Simple Sensor Network 4. Simple Sensor with Sleep Project He then discusses a XBee Internet Gateway (XIG) project ( see his blog), this opens up the borders by allowing the XBee radios to proxy through the ConnectPort X2 and hence be accessible via the Web. Next project, a project to Tweet to a XBee. Professor Faludi concludes the book with a review of the ZigBee stack, a list of plans for the ZigBee platform. Finally there is a resource guide for Arduino, Python, ZigBee,

Digi, etc. This book really offers a end to end introduction to XBee radio networks and is well worth the time for anyone who is hacking or looking at industrial applications in sensor networks.

This book is a \*must\* for anyone working with xBee series 2 radios. After wasting countless hours scouring the internet for info on how to update firmware, and configure/interface with the series 2, I found this book to be a godsend. It is simple to follow and clearly written. The book is broken down into little projects so you can quickly get a network up and running, and then move on to building bigger and more sophisticated networks. Without Faludi's guidance, my xBees would surely be gathering dust on a shelf. I highly recommend this book for anyone interested in building wireless projects!

I probably would have thought twice about buying this book if I knew it was only concerned with the series two xbees. The series one xbees are far more popular and much easier to use. Since this book is presented as an intro to wireless xbees, why only concentrate on the more complicated series two? The series two seems better suited for bigger more ambitious projects that would not have a need for an intro book. Since series one and series two are incompatible, you should google xbee series one vs series two and decide which series you want to work with. If you plan on working with series one, then don't buy this book because you won't be able to do any of the projects very easily.

This is an excellent overview of a difficult subject. I'm pretty new to the Arduino and prior to reading this book had no experience with the XBee. The book gave me enough of a foundation to build a small sensor network for my property (8 wireless nodes controlled by Arduino FIOs); Mr Faludi gives a clear, concise overview of the technologies involved and, perhaps more importantly, the motivations behind selecting different technologies. My remote wireless nodes contain LiPo batteries and I expect to get two to three months between re-charges; this impressive lifetime is due mostly to the implementation of sleep mode, a difficult subject which is very clearly covered in the book. One point of confusion that I still grasp with is the differentiation between series 1 and series 2 xbees. The book exclusively uses series 2 devices, while several of the more notable Arduino hobby sites (adafruit, etc) very vocally prefer the series 1 devices. To my way of thinking (perhaps influenced by the author's position), having sensors in a mesh network makes the most sense; I have yet to read a valid counter argument. I would also recommend that if you are seriously considering implementing a solution with multiple XBees to go ahead and purchase a Digi XPort X2

- they are available via the Digi site (though their online store is terrible) as well as Sparkfun.

Remote management of XBees (including remote firmware updates!) is a very, very nice feature, and the iDigi integration extends this capability to any location on the internet. Pretty sweet. If you're interested, I blog about most of my hobby exploits here: [...]

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