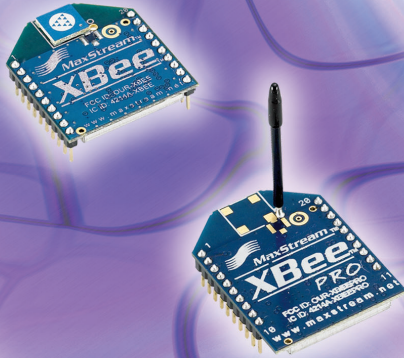
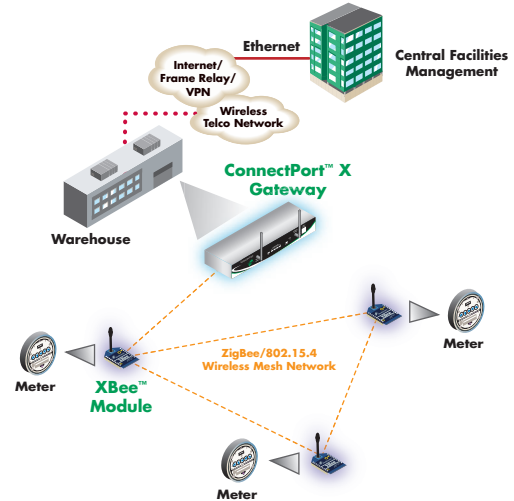


# XBee™ ZigBee®/802.15.4 Modules

2.4 GHz OEM RF Modules



Part of Digi's Drop-in Networking product family, XBee OEM RF modules provide reliable, wireless data communication over ZigBee/802.15.4 networks. Available in Series 1 or Series 2 models for point-to-multipoint or mesh topologies, they enable OEMs with excellent wireless performance in a cost-effective, small form factor solution.



## Features/Benefits

- ZigBee/802.15.4 compatible RF modules
- 2.4 GHz ISM band for use worldwide
- Fully interoperable with other Digi Drop-in Networking products, including gateways, device adapters and extenders
- Available in Series 1 or Series 2 models for point-to-multipoint or mesh topologies
- Pin-swappable regular and long-range –PRO versions
- Low cost
- Common footprint for a variety of Digi RF modules
- Low-power sleep modes
- Multiple antenna options
- Industrial temperature (-40° C to 85° C)

## Overview

The XBee family of ZigBee/802.15.4 RF modules is the premiere choice for OEMs looking for excellent wireless performance in a cost-effective, small form factor solution. Each XBee module comes in either a regular or long-range “-PRO” version\*. All XBee modules are pin-for-pin compatible with the exception of a few varying I/O features, which provides a standard footprint for OEMs with multiple applications.



XBee Series 1 is based on ZigBee/802.15.4 silicon from Freescale®. Its 802.15.4 firmware feature set makes it ideal for point-to-point, peer-to-peer, and point-to-multipoint (star) topologies. The XBee Series 1 gives the user maximum control over network nodes and minimum latency.

XBee Series 2 is based on ZigBee/802.15.4 silicon from Ember™. It features ZigBee firmware for creating ad-hoc mesh networks. The XBee Series 2 performs automatic route discoveries to create a self-healing network of full-function routers and low-power end devices. XBee Series 1 and Series 2 modules do not communicate with one another.

Known for ease of use, the XBee modules are ready to operate out of the box and offer simple AT commands or an API for advanced, user-settable configurations. XBee modules are recognized worldwide for reliable wireless data communication in the license-free 2.4 GHz ISM band. Visit our website for a complete listing of countries that have approved the XBee as a certified, license-free RF module with no need for further testing.

XBee modules are a part of Digi's full line of Drop-in Networking products. ConnectPort X gateways and XBee device adapters, modules and extenders provide end-to-end wireless connectivity to commercial-grade electronic devices in locations where wired infrastructure does not exist or satisfy customer needs. To learn more about Drop-in Networking, visit [www.digi.com/products/wirelessdropinnetworking](http://www.digi.com/products/wirelessdropinnetworking).

## Features/Specifications

Product Selection Guide	Series 1		Series 2	
Silicon	Freescale		Ember	
Firmware	802.15.4		ZigBee	
Network Topologies	Point-to-point, peer-to-peer, point-to-multipoint (star)		Mesh	
	<b>XBee™</b> (Series 1)	<b>XBee-PRO™</b> (Series 1)	<b>XBee™</b> (Series 2)	<b>XBee-PRO™</b> (Series 2)*
Indoor/Urban range	100 ft (30 m)	300 ft (90 m)	133 ft (40 m)	n/a
Outdoor/RF Line-of-Sight Range	300 ft (90 m)	1 mi (1.6 km)	400 ft (120 m)	n/a
	 802.15.4 – Star		 ZigBee – Mesh	

\* XBee-PRO Series 2 coming soon.

### PERFORMANCE

#### General

- RF data rate: 250 Kbps
- Operating temperature: -40° C to 85° C (-40° F to 185° F)

#### Series 1 (XBee / XBee-PRO)

- Indoor/Urban range: 100 ft (30 m) / 300 ft (90 m)
- Outdoor/RF line-of-sight range: 300 ft (90 m) / 1 mi (1.6 km)
- Transmit power output: 1 mW (0 dBm) / 60 mW (+18 dBm) -

**Note:** In Europe XBeePRO modules must be set to 10 mW (10 dBm). In Japan XBP modules are calibrated to 10 mW (10 dBm).

- Receiver sensitivity (1% PER): -92 dBm / -100 dBm

#### Series 2 (XBee)

- Indoor/Urban range: 133 ft (40 m)
- Outdoor/RF line-of-sight range: 400 ft (120 m)
- Transmit power output: 1.25 mW (+1 dBm) (2 mW (+3 dBm) boost mode)
- Receiver sensitivity (1% PER): -97 dBm (-98 dBm boost mode)

### FEATURES

#### General

- Serial data interface: 3.3V CMOS UART
- Configuration method: API or AT commands, local or over-the-air
- Frequency band: 2.4 GHz
- Interference immunity: DSSS (Direct Sequence Spread Spectrum) channels

#### Series 1

- Serial data rate: 1200 - 250000 bps
- (6) 10-bit ADC inputs, (8) Digital I/O

#### Series 2

- Serial data rate: 1200 – 1 Mbps
- (4) 10-bit ADC inputs, (10) Digital I/O

### NETWORKING AND SECURITY

- Encryption: AES 128-bit
- Reliable packet delivery: Retries/Acknowledgments
- PAN ID, 64-bit IEEE MAC address, 16 channels (12 channels – XBee-PRO Series 1)

### POWER REQUIREMENTS

#### Series 1 (XBee / XBee-PRO)

- Supply voltage: 2.8 – 3.4 VDC / 2.8 – 3.4 VDC
- Transmit current (@ 3.3 V): 45 mA / 215 mA
- Receive current (@ 3.3 V): 50 mA / 55 mA
- Power-down current: <10 uA / <10 uA

#### Series 2 (XBee)

- Supply voltage: 2.1 – 3.6 VDC
- Transmit current (@ 3.3 V): 35 mA (40 mA boost mode)
- Receive current (@ 3.3 V): 38 mA (40 mA boost mode)
- Power-down current: <1 uA (@ 25 °C)

### ANTENNA OPTIONS

- Wire whip antenna
- Chip antenna
- U.FI RF connector
- RPSMA female RF connector

### REGULATORY APPROVALS

#### Series 1 (XBee / XBee-PRO)

- U.S. (FCC Part 15.247): OUR-XBEE / OUR-XBEEPRO
- Canada (IC): 4214A-XBEE / 4214A-XBEEPRO
- Europe (CE): ETSI / ETSI (max. tx power output: 10 mW)
- Australia
- Japan

#### Series 2 (XBee)

- U.S. (FCC Part 15.247): OUR-XBEE2
- Canada (IC): 4214A-XBEE2
- Europe (CE): ETSI
- Japan

Please visit [www.digi.com](http://www.digi.com) for part numbers.

**DIGI SERVICE AND SUPPORT** - You can purchase with confidence knowing that Digi is here to support you with expert technical support and a one-year warranty. [www.digi.com/support](http://www.digi.com/support)

#### Digi International

11001 Bren Road E.  
Minnetonka, MN 55343  
U.S.A.  
PH: 877-912-3444  
952-912-3444  
FX: 952-912-4952  
email: [info@digi.com](mailto:info@digi.com)

#### Digi International France

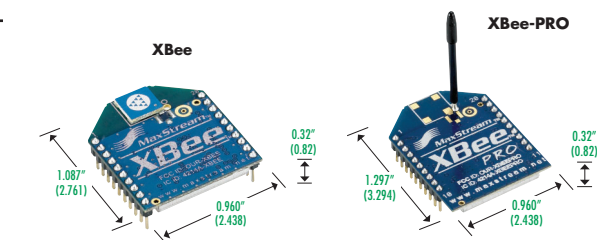
31 rue des Poissonniers  
92200 Neuilly sur Seine  
PH: +33-1-55-61-98-98  
FX: +33-1-55-61-98-99  
[www.digi.fr](http://www.digi.fr)

#### Digi International KK

NES Building South 8F  
22-14 Sakuragaoka-cho,  
Shibuya-ku  
Tokyo 150-0031, Japan  
PH: +81-3-5428-0261  
FX: +81-3-5428-0262  
[www.digi-intl.co.jp](http://www.digi-intl.co.jp)

#### Digi International (HK) Limited

Suite 1703-05, 17/F,  
K Wah Centre  
191 Java Road  
North Point, Hong Kong  
PH: +852-2833-1008  
FX: +852-2572-9989  
[www.digi.cn](http://www.digi.cn)



© 2006-2007 Digi International Inc.

All rights reserved. Digi, Digi International, the Digi logo, the When Reliability Matters logo, ConnectPort, XBee, XBee-PRO and XStream are either trademarks or registered trademarks of Digi International Inc. in the United States and other countries worldwide. All other trademarks are the property of their respective holders.

WHEN  
**RELIABILITY**  
MATTERS™

Digi International, the leader in device networking for business, develops reliable products and technologies to connect and securely manage local or remote electronic devices over the network or via the web. With over 20 million ports shipped worldwide since 1985, Digi offers the highest levels of performance, flexibility and quality.

[www.digi.com](http://www.digi.com)

91001412  
A1/1007

