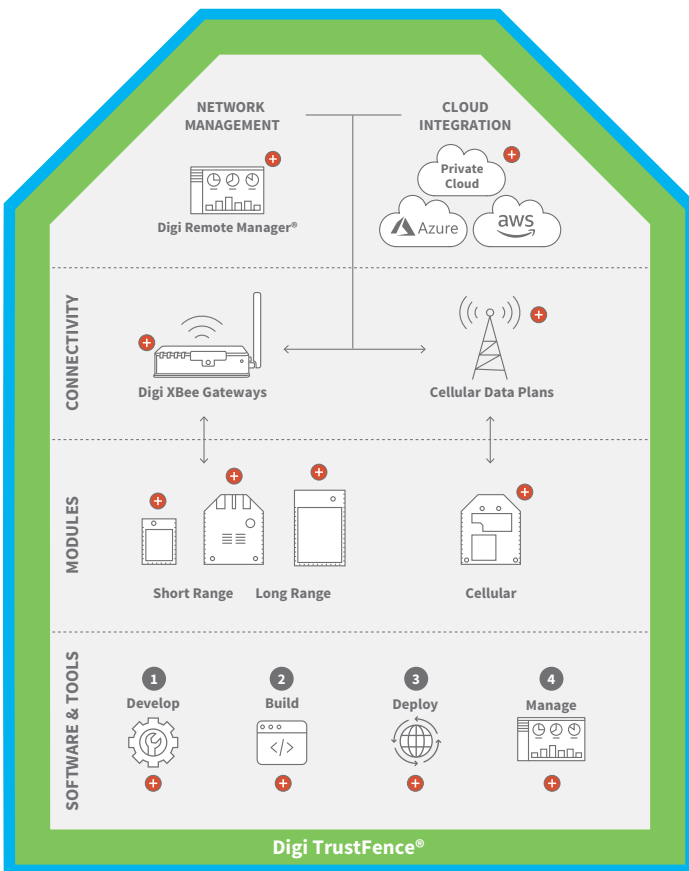




Digi XBee: The Ecosystem for Wireless Development

What Is the Digi XBee “Ecosystem”?

To help development teams accelerate the development of secure wireless devices, Digi provides a wealth of software, code libraries and tools. Developers can quickly prototype and develop applications using XBee development kits and tools for developing, building, deploying and managing them.



Digi Wireless Design Services
Requirements • Software • HW/RF • Certifications

Digi XBee Tools

Digi XBee Tools is an award-winning suite of hardware, software and libraries designed to support the entire product lifecycle, including:

- Prototyping, testing and development
- Building the completed product
- Commissioning and deployment
- Monitoring, management and maintenance of the devices

Digi provides many of these tools free of charge.

Here are three examples of Digi XBee Tools:

- **Digi XCTU®:** XCTU is an intuitive tool for configuring, mapping and range testing your devices.
- **Digi XBee PyCharm IDE plugin:** The Digi PyCharm IDE plugin allows you to add application logic and to deploy and debug code directly on the module using a powerful development suite.
- **Digi XBee Mobile SDK:** The Digi XBee Mobile SDK lets developers integrate Bluetooth communication.



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Digi XBee® modules come in both short range and long range, to suit varying application requirements.

Short-Range Modules

Short-range Digi XBee modules operate on 2.4 GHz and support multiple IoT protocols. For example, the 802.15.4 protocol enables fast, low latency point-to-point and point-to-multipoint communications. Consider applications that require remote control, when you have direct line-of-sight access and close range. Digi's two mesh technologies, Zigbee and DigiMesh, are both excellent options as they support self-routing and self-healing mesh networks.

The right mesh protocol depends on your needs. Digi provides a description of the differences in the blog, ***What Are the Differences Between DigiMesh and Zigbee Mesh?*** For example, a key difference is that DigiMesh supports completely battery-powered networks.

Important features of Digi short-range modules:

- Pin and software compatibility make it easy to swap technology and migrate to new modules when they become available.
- Modules are pre-certified in multiple regions around the world which dramatically reduces time-to-market.

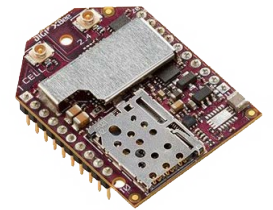
Long-Range Modules

Digi modules for long-range application requirements include sub-GHz modules, which support 868 MHz and 900 MHz, and Digi XBee cellular modems.

A sub-GHz module provides increased range at lower throughput compared to 2.4 GHz, and is also more capable of penetrating obstacles. These modules therefore work well not only for long-range applications but also indoor applications where walls and barriers can otherwise block signals.

Cellular Modems

Digi XBee Cellular modems offer the easiest way to integrate cellular connectivity into an OEM device. Cellular modems support everything from 3G to LTE Cat-1, LTE-M, and NB-IoT, and are a great choice in remote areas where there is limited Wi-Fi access. Digi XBee Cellular solutions provide easy cellular connectivity without having to go through a costly FCC or carrier end-device certification process.



Digi XBee Form Factors

There are three different XBee hardware form factors:

- A micro module, or “MMT”
- A through-hole module, with pins on the bottom
- A larger SMT (surface mount) module for backwards-compatibility

Digi Cellular XBee modules are a variant of through-hole. These modules include another SIM slot and UFL connector, and also offer multiple antenna options, such as PCB or chip antenna, UFL, SMA, and RF pad connector.

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Pre-Certified Modules Expedite Development

Wireless certifications can be costly and complex, and failures can impact your time-to-market, particularly if you have a global deployment strategy.

Digi XBee modules are pre-certified in many regions of the world, including the United States and countries throughout Europe to help reduce the friction, cost, risk and complexity involved in getting a wireless product to market.

Digi TrustFence

Another important part of the complete XBee ecosystem is Digi TrustFence®. TrustFence is a security framework that includes several fully implemented XBee security features, including secure boot and secure storage, to prevent unauthorized access via logins and data communications.

With TrustFence, manufacturers integrate wireless modules into their designs without the time, expense and on-site expertise of a security professional.

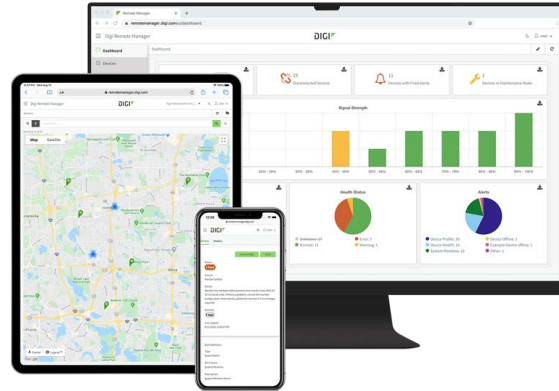


Gateways and Remote Management

Some modules, such as the 2.4 GHz and sub-GHz modules, require a gateway to bridge between RF and IP for remote connectivity. Digi provides programmable gateways with support for cellular, Ethernet and Wi-Fi connectivity. Available gateways include both indoor and industrial models for applications in rugged environments.

Because Digi XBee cellular modules include an IP stack, they can connect directly to the Internet. As needed, customers can integrate third-party cloud services such as Amazon Web Services, Microsoft Azure and Google Cloud.

To facilitate this, customers can use Digi Remote Manager® which includes a full suite of APIs, as well as instructions and examples.



Digi Remote Manager

Digi Remote Manager offers a complete command center for your deployed Digi device network, with features such as automated secure firmware updates, configuration management, device health monitoring, alarms and security monitoring.

Digi RM provides access to cellular XBee modules and RF modules connected through a gateway, providing both integration with cloud applications and customizable edge compute functionality with MicroPython.

Finally, Digi Remote Manager also provides secure out-of-band management of any of your IP-based devices through a command line and a serial connection. Ask your representative for information on out-of-band management with Digi Remote Manager.

Today it is important to build future-proof designs that can upgrade and scale to help you navigate market shifts.

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Designing for the Future

The IoT is growing, and markets and demands are ever changing. Today it is important to build future-proof designs that can upgrade and scale to help you navigate those changes.

Digi XBee modules are designed with this in mind, with footprint, pinout and software compatibility. This means you can easily migrate to a newer module without changing carrier boards or rewriting your code. You will not typically find these benefits in a less integrated module.

Digi XBee modules also integrate seamlessly with full-featured Digi ConnectCore® system-on-modules (SOMs), enabling you to build complete solutions for a wide range of markets. Digi ConnectCore SOMs include excellent developer support in the form of code libraries, examples and documentation.

Building and Deploying Your Product

The lifecycle of a wireless product includes many steps from prototyping and designing to testing, building, deploying and managing a network of devices. Digi XBee Multi Programmer facilitates the build step, allowing the programming of up to 6 XBee modules concurrently, including firmware configuration settings and MicroPython code. To further expedite the build process, you can connect multiple programmers simultaneously.

Digi XBee Network Assistant is another tool in the Digi XBee Tools suite that supports rapid, seamless deployment. This software tool simplifies and expedites installation of multiple devices by enabling the installer to map and visualize network routes and link quality.

Digi XBee 3 USB Adapter, another member of the tool suite, eliminates the need for a development board. The USB stick contains an XBee node that can connect directly to a PC, which is useful for installers who are doing onsite deployment and maintenance.



Digi XBee Example Applications

The world-renowned Digi XBee module recently crossed the milestone of 15 million deployments worldwide. Popular for its full breadth of supporting tools, integrated security, the ability to remotely monitor and manage the deployed network and update firmware for all devices with a few clicks, Digi XBees are deployed far and wide – from the backyard to the farm to outer space.

Developers build XBees into industrial applications like monitoring of agricultural feed bins and water supplies, electric vehicles, robotics, and automated remote processes such as crop frost fans. You can read more at www.digi.com/customer-stories.

Digi XBee modules are built for ease of use to support rapid development, certification and smart deployment strategies, including battery-saving sleep mode to reduce data costs and maintenance requirements. In other words, they are designed not only to support your go-to-market strategy but to stand the test of time, all of which adds up to a lower total cost-of-ownership.



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