

# Getting Started Guide



## *XTend<sup>®</sup> DigiMesh Development Kit*

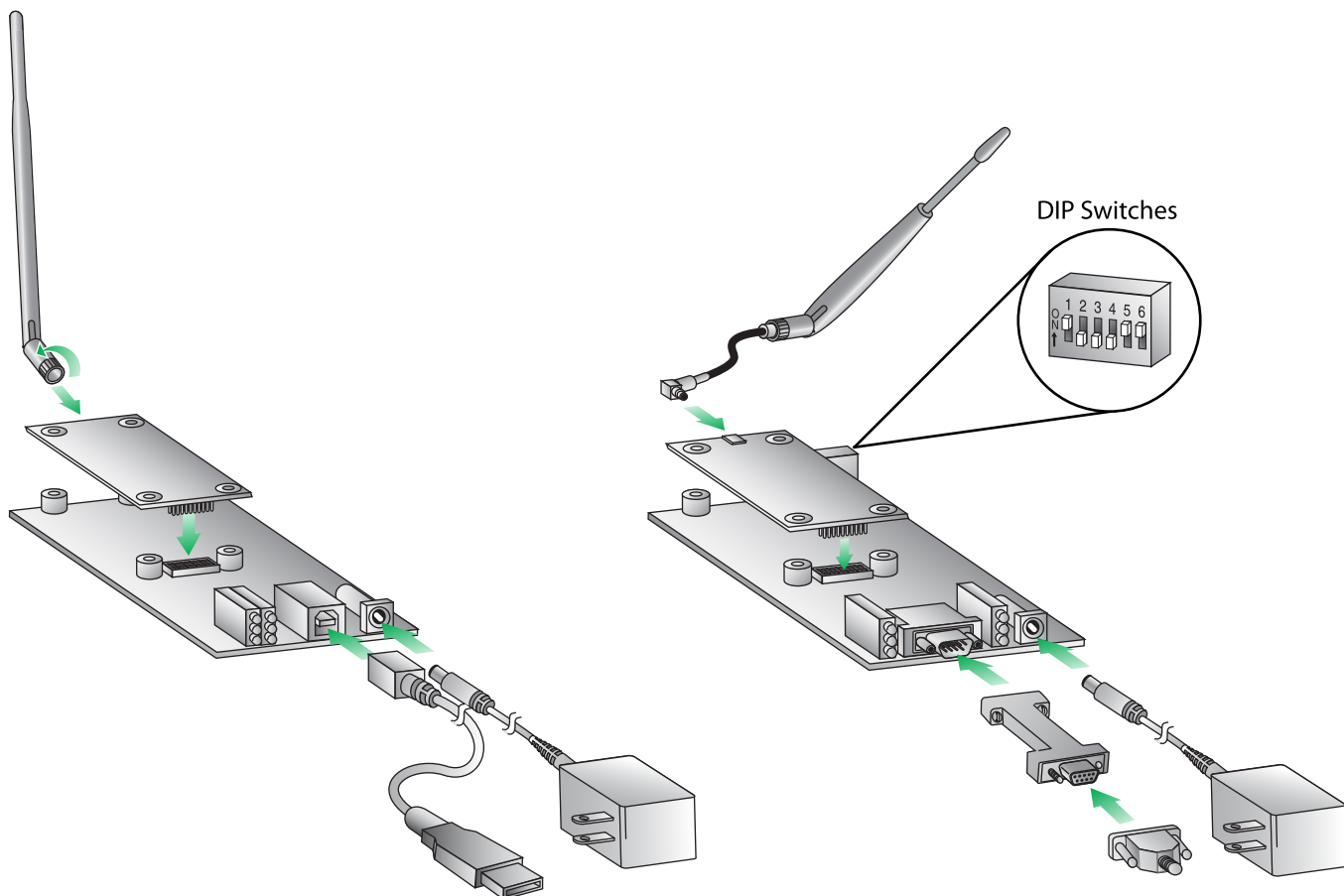
This guide provides instructions for setting up wireless links and testing the XTend module's ability to transport data over varying ranges and conditions. It covers these tasks:

- Connect the hardware
- Set up a range test
- Perform a range test
- Explore advanced configurations

Create long-range wireless links in minutes!

## *Connect the Hardware*

Connect the hardware as shown in the following images:



- XTend embedded module
- USB interface board
- Antenna-RPSMA (male)
- USB cable
- Power supply

- XTend embedded module
- RS-232 interface board
- Serial loopback plug
- Null modem adapter (male)
- Antenna-MMCX (male)
- Power supply

# *Set up Range Test*

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## **Install X-CTU Software**

X-CTU is a stand alone tool for configuring RF modules and is used to run the range test.

To install X-CTU:

1. Go to the X-CTU software page at [www.digi.com/xctu](http://www.digi.com/xctu) and launch the latest X-CTU installer.
2. Follow the prompts on the installation screens.
3. When the installation is complete, start X-CTU by selecting:

**Start > Programs > Digi > X-CTU**

The X-CTU software is ready to be used.

## **Install USB Drivers (Hardware USB and Virtual COM port drivers)**

The USB interface board is a “plug-and-play” device that should be detected by the PC automatically. To interface between the modem and a PC, two drivers must be installed: a USB driver, and a virtual COM port driver that makes the USB port look and perform like a physical COM port. Go to [www.digi.com/xctu](http://www.digi.com/xctu) and click the **Drivers** link. Under **General Drivers**, select the appropriate operating system to download drivers.

# Perform Range Test

Objective: To determine the range capabilities of the XTend modules.

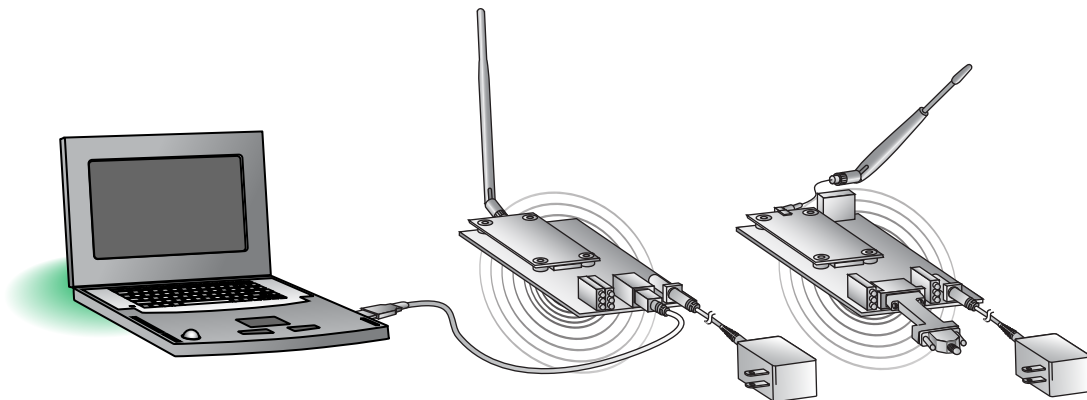
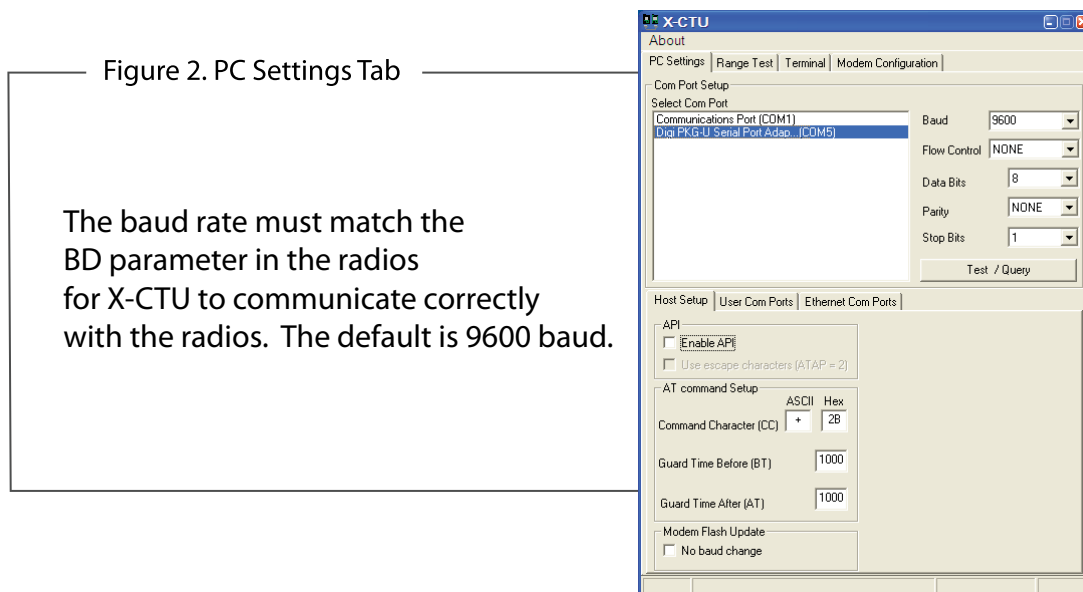


Figure 1. Range Test Setup

## Run Range Test

1. Launch the X-CTU Software: **Start > Programs > Digi > X-CTU**
2. On the **PC Settings** tab [Figure 2], select the PC serial COM port that will be used. The standard COM port for the 9-pin serial port is COM 1. The USB ports are labeled as **Digi PKG-U Serial Port Adapters** and are assigned a number based on your PC's settings.



3. Verify that the baud rate and data settings match the internal settings of the radios. The default settings for the radios are:  
Baud Rate: 9600, Flow Control: NONE, Data Bits: 8, Parity: NONE, and Stop Bits: 1.

4. Select the **Range Test** tab [Figure 3].

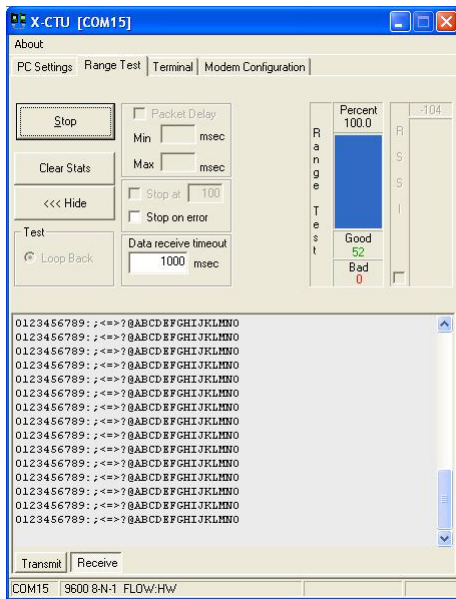


Figure 3. Range Test Tab

Clicking the **Advanced >>>** button displays several more options. If you run the range test with several mesh radios acting as intermediaries, you will want to increase the **Data receive timeout** value to compensate for the additional latency.

(Packet Information)

5. Click **Start** to begin the range test.
6. Monitor the link quality by reading the **Percent** section on the **Range Test** tab. This section displays the running percentage of good packets sent to the receiving radio and looped back to the base.
7. Click **Stop** to end the range test.

Tip: Range test works best if the USB interface board is attached to a mobile laptop and you increase the distance between the base and the remote while monitoring the link quality on the laptop monitor.

# Explore Advanced Configurations

## RF Module Configuration

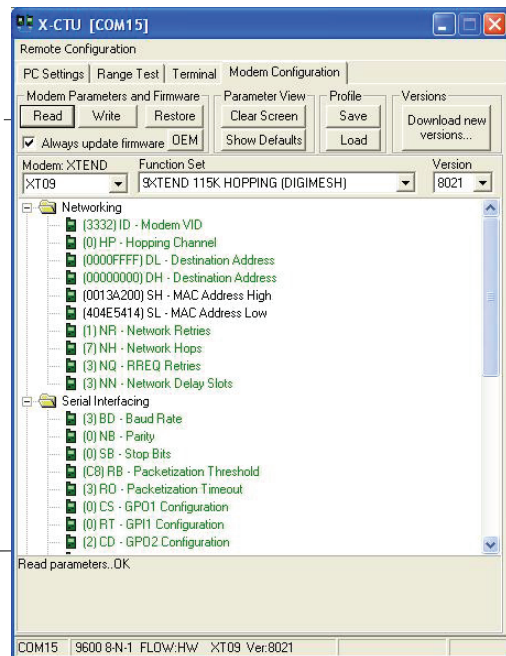
To configure RF module parameters:

1. On the X-CTU **Modem Configuration** tab, click **Read**.
2. Select any of the module parameters you wish to change, such as **Hopping Channel** or **Power Level**, type in a new value, then click **Write** to save to non-volatile memory [Figure 4].
3. (Optional) To direct a unicast message to a particular node, set the DL/DH parameters on the transmitting module to match the SL/SH parameters of the receiving module.
4. To restore the module back to defaults, click **Restore**.

This is one of several configuration methods. For other methods, refer to the XTend product manual.

Figure 4. RF Module Configuration

Click **Read** to display a list of the RF module configuration parameters. Parameters shown in green are still set to default. Parameters in blue have been changed. Parameters in black are read-only.

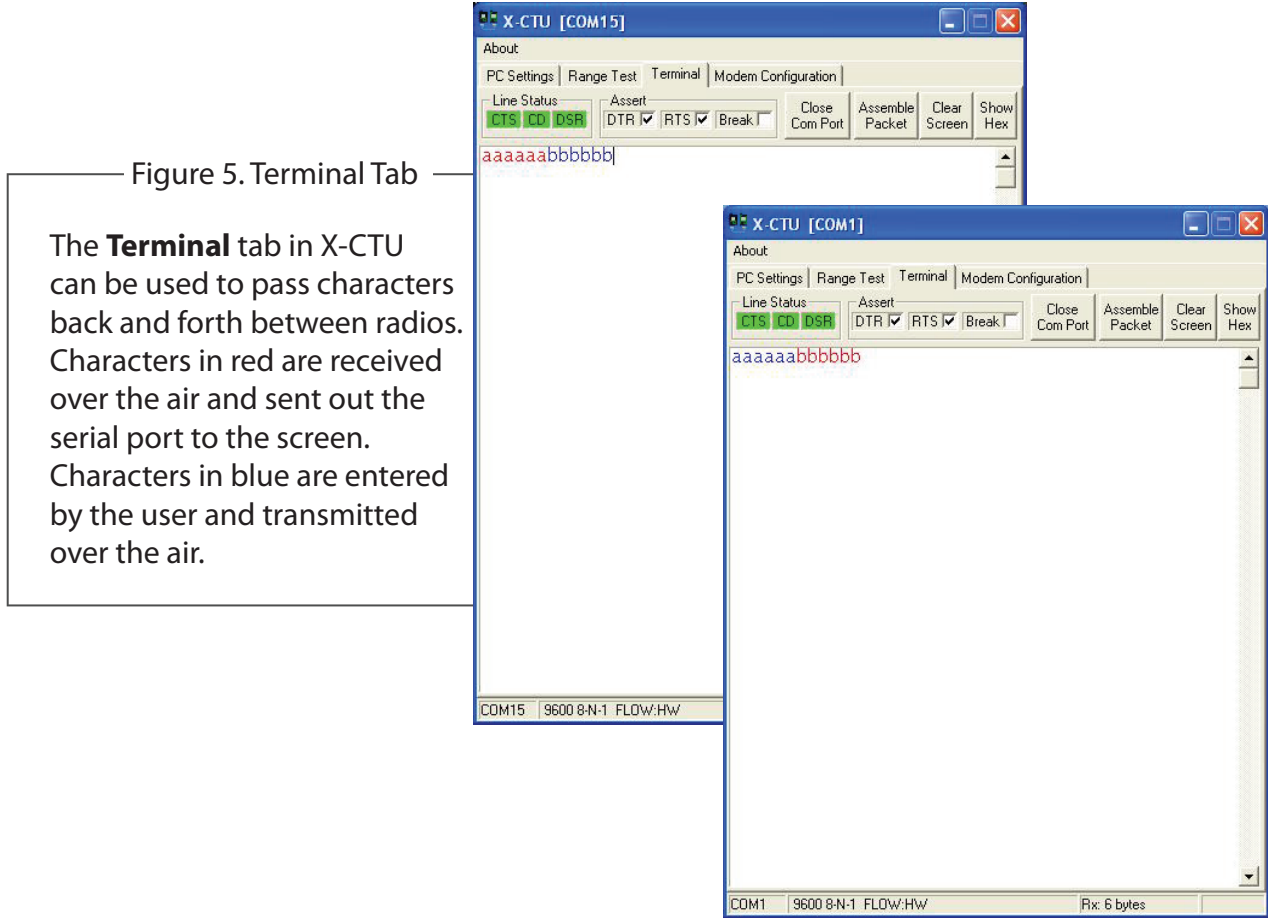


# Mesh Demonstration

To test the capabilities of your mesh network without having to have the radios spaced miles apart, you can lower the power level (PL) of the radios to 0 (1 milliwatt). See the RF Module Configuration section for more details on how to change the parameters in your radio.

- 1. Restart the Range Test.
- 2. Move the remote away from the base until the signal is lost.
- 3. Assemble and power on another module and interface board. The interface board does not require a null modem adapter or serial loopback plug.
- 4. Place this radio halfway between the remote and the base.

The intermediate radio bridges the gap between the remote and the base and reestablishes communication. The mesh network has “self-healed” by redirecting communications as soon as a pathway becomes available. The radios are configured for broadcast mode by default so they can route information and communicate with one another automatically.



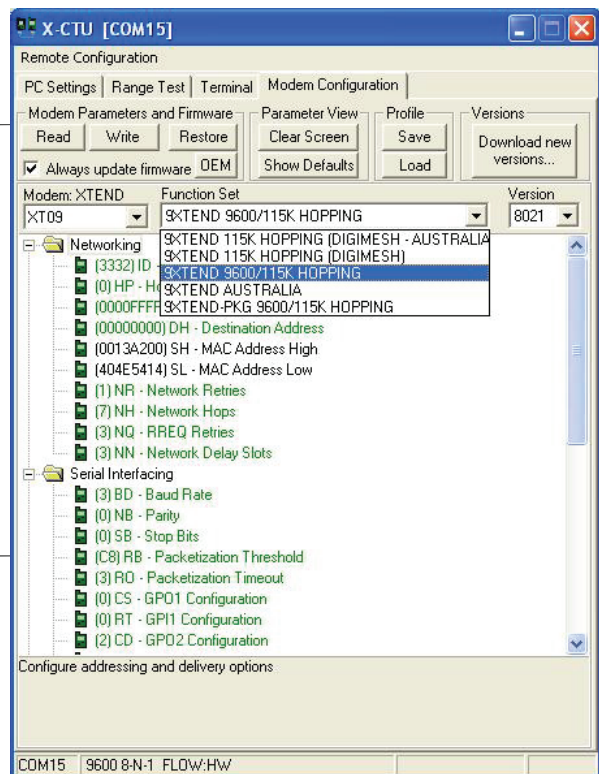
## Change Firmware Version

XTend modules can also be set up for multipoint communications. In some cases, a multipoint solution may be a better option. Point-to-multipoint is better for networks not needing routing capabilities. This topology also has more predictable timing and faster throughput. If you wish to try multipoint mode, simply load different firmware on your XTend modules using X-CTU:

1. Launch X-CTU and select the appropriate COM Port.
2. Set the PC settings to defaults:  
Baud Rate: 9600, Flow Control: NONE, Data Bits: 8, Parity: NONE, Stop: Bits 1.
3. Click the **Modem Configuration** tab.
4. Select the modem type. To load the point-to-multipoint firmware for the XTend module, select modem type **XT09** and function set **9XTEND 9600/115K HOPPING** or **9XTEND AUSTRALIA**. [Figure 6].
5. Select the desired firmware version.
6. Click the **Show Defaults** button. This helps to avoid out of range errors since some parameters have different limits based on the firmware type.
7. Check the **Always update firmware** check box.
8. Click **Write**.

Figure 6. Point-to-Multipoint Firmware

The firmware version at the bottom of the **Version** drop-down menu is the latest available.



## Questions?

If you have further questions, please contact Digi technical support.  
(<http://www.digi.com/support/eservice/login.jsp>)

## Contact Digi International

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