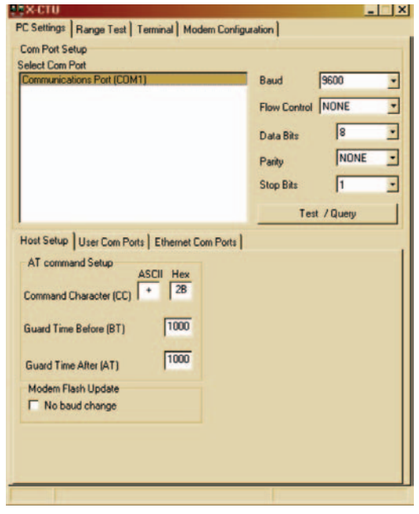
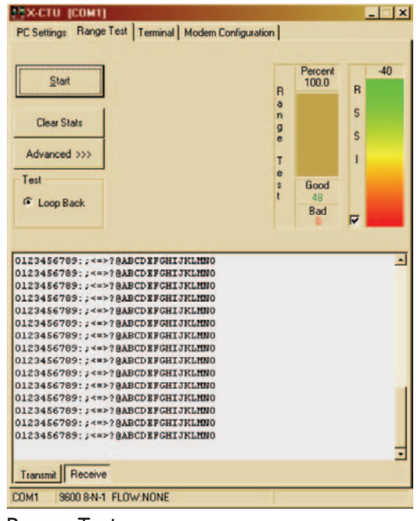
Figure 4



PC Settings



Range Test

NOTE: Failure to enter AT Command Mode
is most commonly due to baud rate mismatch. Ensure the 'Baud' setting on the "PC Settings" tab matches the interface data rate of the module [BD (Interface Data Rate) parameter = 9600 bps by default].

Run Range Test (continued)

3. The Serial Loopback Adaptor should be placed on the ROUTER/END DEVICE whose 64-bit address has been entered with the ATDH and ATDL parameters from the COORDINATOR. [Figure 3]
4. Select the "Range Test" tab. [Figure 4]
5. Click the 'Start' button to begin the range test.
6. Move the ROUTER/END DEVICE (with red Serial Loopback Adaptor) away from the COORDINATOR to find the maximum range of the wireless link.
7. Change the Loopback Adaptor to any other ROUTER/END DEVICE and repeat if desired.
8. Mesh networking capabilities can be observed by moving the ROUTER/END DEVICE that you are communicating with out of range of the COORDINATOR. Power another ROUTER/END DEVICE between the COORDINATOR and the out of range ROUTER/END DEVICE to reestablish communications. Messages are now being routed through the new ROUTER/END DEVICE.

Contact MaxStream (Office hours are 8am – 5pm U.S. Mountain standard time)

Phone: (801) 765-9885, Live Chat: www.maxstream.net, E-mail: rf-xperts@maxstream.net

Quick Start Guide

XBee Series 2 OEM Development Kits

Introduction
Range Test Setup
Node Discovery

Create long range wireless links in minutes!

Introduction

This Quick Start Guide provides step-by-step instruction on how to setup wireless links and test the modules' ability to transport data over varying ranges and conditions. This guide illustrates how to discover all nodes in your network and set parameters to run a Range Test.

Range Test Setup

Required Components

(1) XBee Series 2 COORDINATOR AT (XB24-BWIT-002)
(At least 1) XBee Series 2 ROUTER/END DEVICE AT (XB24-BxIT-004)
(1) USB Interface Board* (XBIB-U-DEV) (for interfacing between an RF module & host PC)
(1) RS-232 Interface Board (XBIB-R-DEV) (for looping data back to the base from a remote)
(1) PC (Windows 2000 or XP) with an available USB (or RS-232*) port. Required installations:
X-CTU Software & USB drivers (Note: Drivers for LINUX and Mac OS X are provided on the CD, but the X-CTU Software will only run on Windows.)
Accessories (1 USB Cable, 1 Serial Loopback Adaptor [RED] & 1 power supply)

* XBee Series 2 Developer Kits (XB24-BPDK) contain four RS-232 boards. An RS-232 board (w/ RS-232 cable & power supply) can be used in lieu of the USB option.

Software Installations

Install X-CTU Software

Double-click "setup_X-CTU.exe" file and follow prompts of the installation screens. This file is located on the MaxStream CD and under the 'Software' section of the following web page: www.maxstream.net/support/downloads.php

The X-CTU Software interface is divided into the four following tabs:

- PC Settings - Setup PC serial COM ports to interface with the RF module
- Range Test - Test the range of wireless links under varying conditions
- Terminal - Read/Set RF module parameters and monitor data communications
- Modem Configuration - Read/Set RF module parameters

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MD0026 [2007.04.25]

Software Installations (continued)

Install USB Drivers (Hardware USB Bus & Virtual COM Port drivers)

The following steps were recorded while using the Windows XP operating system.

1. Verify the MaxStream CD is inserted into the CD drive.
2. Connect the USB development board to a PC using USB cable.
   - ▶ After the module assembly is detected by the PC, a "Found New Hardware Wizard" dialog box should appear.
3. Select the 'No, not this time' option; then select the 'Next' button.
4. Select 'Install from a specific list or location (Advanced)' option; then select the 'Next' button.
5. a. Select the 'Search for the best driver in these locations' option.
   b. Check 'Search removable media (CD-ROM...)' box; then select 'Next'.
   The "Windows Logo Testing" alert box appears.
6. Select the 'Continue Anyway' button.
7. Select the 'Finish' button.
8. Repeat steps 2 through 6 to install the next driver.
9. Reboot the PC if prompted to do so.

Node Discovery

Discovery of All Nodes in a Network

1. Mount XBee Series 2 Modules to the USB & RS-232 development boards.
   - ▶ The module mounted to the USB board should be the COORDINATOR (XB24-BWIT-002). The modules mounted to the RS-232 boards are all ROUTER/ END DEVICES (XB24-BxIT-004).
2. [Only for use with modules that have the U.FL antenna connector XB24-BWUT-004] Connect the RF Cable Assembly to the U.FL antenna connector and RPSMA half wave dipole antenna.
3. After installing the X-CTU Software and USB drivers, connect the COORDINATOR module assembly to the PC using a standard USB cable. Connect power supplies and power on all other radios.
4. Under the "PC Settings" tab select the COM port to which your COORDINATOR is attached.
   NOTE: If the COORDINATOR was powered first, as the other radios are turned on, the red LED will blink at a rate of twice per second.

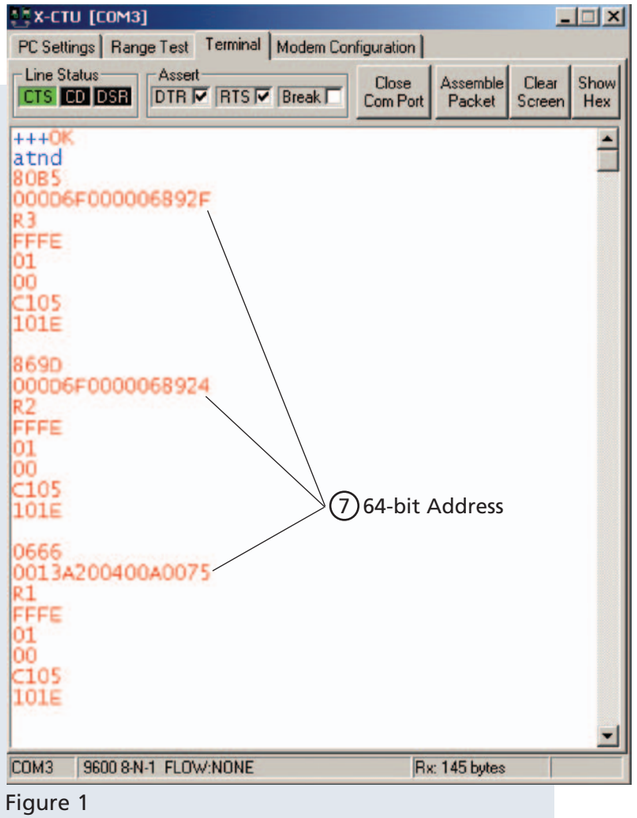

Figure 1

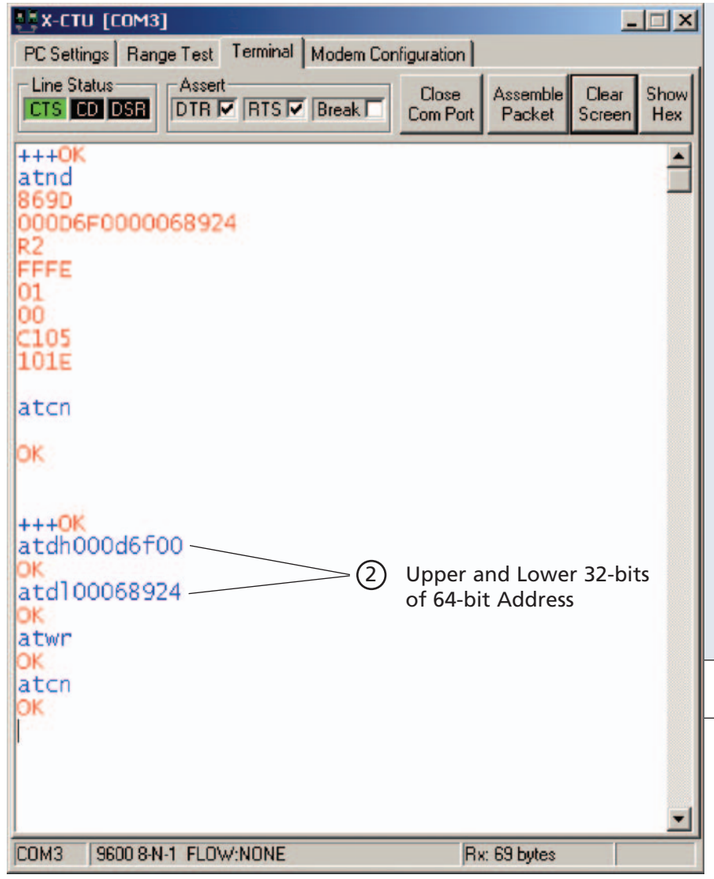

Figure 2

5. In the "Terminal" tab, enter command mode by observing the 1 second guard times before and after entering the "+++" command mode sequence. You should receive the "OK" response if command mode has been correctly entered. If you are not familiar with entering command mode and AT commands, please refer to the product manual under the Command Mode section for further information.
6. From X-CTU, while in command mode (command mode will automatically be exited with 10 seconds of inactivity) enter the ATND command followed by a carriage return. All powered ROUTERS/END DEVICES that have joined the network, will respond with their device information.

⑦ The second field returned from the ATND parameter is the 64-bit address of each particular ROUTER/END DEVICE. [Figure 1]

Range Test

Use the "Terminal" and "Range Test" tabs of the X-CTU Software to:

- Set parameters on the COORDINATOR module to communicate with a specific ROUTER/END DEVICE module
- Determine the range capabilities of the XBee Series 2 Modules

Run Range Test

1. Follow the directions in the previous example to perform a Node Discovery.

② Use the ATDH and ATDL commands to set the destination address high and the destination address low of the COORDINATOR to match the 64-bit address of the particular ROUTER/ END DEVICE with which you wish to communicate. Use ATDH for the upper 32 bits and ATDL for the lower 32 bits of the 64-bit address. [Figure 2] The "Modem Configuration" tab can be used to do this as well.

Figure 3 Hardware Set-up