XLR PRO Radio Frequency (RF) Modem

Getting Started Guide

XLR PRO Radio Frequency (RF) Modem Getting Started Guide (90002203)

Revision	Date	Description
A	September 2014	Initial release.
B	March 2014	Updated to include new illustrations for the power supply and miscellaneous editorial corrections.
C	May 2015	Updated to revise web configuration home screen available with XLR PRO firmware version 1006.
D	December 2015	Updated to include documentation of USB support available with XLR PRO firmware version 1007.
E	February 2016	Updated to include XLP PRO INTL kit.

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Before you begin

This guide provides instructions for setting up a pair of XLR PRO (or XLR PRO INTL) modems to transport data. By working through the steps in this guide, you will learn how to do the following:

- Connect XLR PRO hardware
- Install XCTU software
- Set up and test serial communications using XCTU
- Set up a range test using XCTU
- Access the XLR PRO web configuration interface

Gather required materials

To follow along with the steps in this guide, you need the following:

Item	Description
XLR PRO Starter Kit (Two kits, Part Number XL9-UA)	To perform the steps in this guide, you need two starter kits. Each kit contains the following: ■ XLR PRO RF Modem ■ Power supply ■ XLR PRO INTL kit only: Power plug adapter kit ■ Network (RJ45) cable ■ RJ45/DB9F adapter ■ Mini USB cable ■ Antenna
Laptop or PC	**Minimum hardware and software** The laptop or PC must meet the minimum hardware and software requirements for running XCTU software. The instructions in this guide assume you're using a laptop or PC running Microsoft Windows. **Available USB ports—2 ports** You need one available USB port for each XLR PRO modem. Only one computer is required to follow along with the steps in this guide. However, you can use two computers—one for each XLR PRO modem. For range testing, a laptop is recommended.

Item	Description
XCTU software	Version 6.2 (or later)
Ethernet switch	To access the XLR PRO web configuration interface, you need to be able to connect the XLR PRO to your network.

For more information

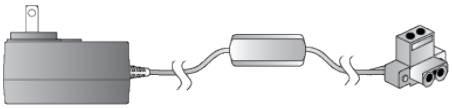
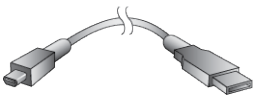
XLR PRO Radio Frequency (RF) family of products includes the following publications:

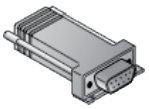
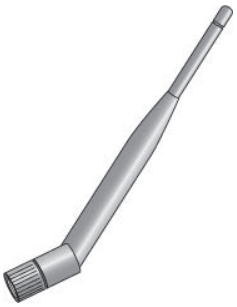
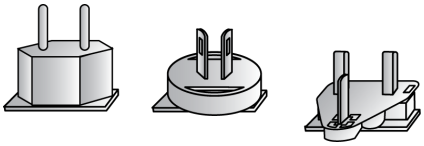
Title	Part number	Description
XLR PRO Radio Frequency (RF) Modem Quick Start Guide	90002204	Provides a brief summary of the XLR PRO and XLR PRO INTL Radio Frequency (RF) Modem kit.
XLR PRO Radio Frequency (RF) Modem Getting Started Guide	90002203	Provides step-by-step instructions for setting up a pair of XLR PRO (or XLR PRO INTL) modems to test over-the-air communications between the radios.
XLR PRO Radio Frequency (RF) Modem User Guide	90002202	Provides complete information on all XLR PRO and XLR PRO INTL Radio Frequency (RF) Modem features; describes how to configure XLR PRO modems using XCTU, the Web configuration interface, and Device Cloud; provides reference information on all supported AT commands and API frames.

Step 1: Connect XLR PRO hardware

XLR PRO kit contents

The following table shows the XLR PRO accessories kit.

Item	Description
	XLR PRO modem
	Power supply
	Network cable
	Mini USB cable

Item	Description
	RJ45/DB9F adapter
	Antenna
	**Note:** Australian kit only: Power plug adapter kit (UK, EU, AS)

Connect the hardware

The following figure shows how to connect the XLR PRO cables and antenna.

For a serial connection

- Connect the XLR PRO mini USB port to a USB type A port on your computer or laptop using a mini USB cable.

For Ethernet or Ethernet bridging

- Connect an XLR PRO Ethernet port using a network cable.

WARNING! Use the serial port for serial connections only. Do not connect the serial RJ45 port to any PoE (power over Ethernet) device. Doing so could permanently damage the XLR PRO or PoE device and void your XLR PRO warranty.

For both XLR PRO modems

- Attach an antenna to the XLR PRO before powering on the device.

Step 2: Download and install XCTU

Digi International XCTU is a free multi-platform application that enables developers to interact with Digi RF modules through a simple-to-use graphical interface. It includes tools that make it easy to set-up, configure, and test Digi RF modules.

Download and install XCTU

For XLR PRO support, make sure you install XCTU version 6.2 or later.

To download and install XCTU:

1. Go to www.digi.com/xctu.
2. Launch the XCTU installer and follow the prompts on the installation screens.

Launch XCTU

To launch XCTU:

- Double-click  . The XCTU Main Display appears.

To get help using XCTU, click  and select **Help Contents**.

Step 3: Set up and test serial mode using XCTU

This section describes how to set up a pair of XLR PRO RF modems using XCTU software to test serial communications.

Note In these instructions, the first XLR PRO is called radio 1 and the second XLR PRO is called radio 2.

Set up a pair of XLR PRO RF modems

To set up and test serial communications follow these steps.

Download and install USB driver

- Download and install the XLR PRO USB driver available here:

  www.digi.com/support/productdetail?pid=5603&type=drivers

Connect the XLR PRO modems to your PC

1. Connect two XLR PRO RF modems to your PC using a mini USB cable:

   For each XLR PRO RF modem, use a mini USB cable to connect the XLR PRO mini USB port to an available USB type A port on your PC.

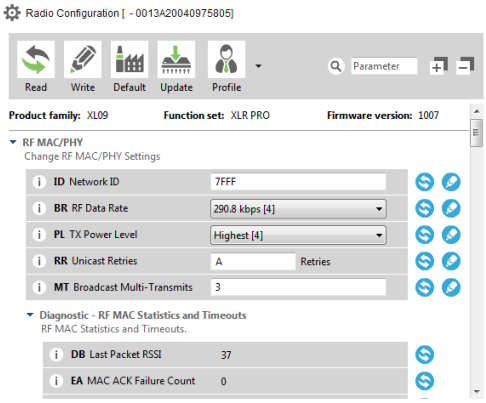
2. For both XLR PRO RF modems, attach an antenna before powering on the modem.
3. Position the XLR PRO RF modems at least two meters apart to protect circuitry during data transmissions.

Note At the default power level setting, if the XLR PRO RF modems are operated at close range, the high output power may saturate the RF receiver and cause data loss. This can also cause permanent damage to the receiver.

Set up radio 1

1. Power on radio 1.
2. Launch XCTU.
3. Click  . The Add a radio device dialog appears.

4. Select the following:
   - **Select the serial/USB port:** Select the USB port connected to radio 1.
   - **Baud Rate:** Select 9600.
   - **Data Bits:** Select 8.
   - **Parity:** Select None.
   - **Stop Bits:** Select 1.
   - **Flow Control:** Select None.
5. Click **Finish**. XCTU discovers the XLR PRO RF modem and displays it in the list of radio modules.



6. In the list of radio modules, click the XLR PRO RF modem. XCTU reads and displays the configuration.
7. Configure the following parameters:
   - **ID:** Set the Network ID to an available network ID. For example, set the Network ID to 0xD161. You need to configure radio 2 with the same network ID.
   - **PL:** If radio 1 and radio 2 are positioned close together (that is, less than one to two meters distance between the radios), set the power level to 0 (Lowest).
   - **NI:** (Optional) Use the NI command to assign a name or description to the radio. In this way, you can easily identify the radio in XCTU without relying solely on the serial number.

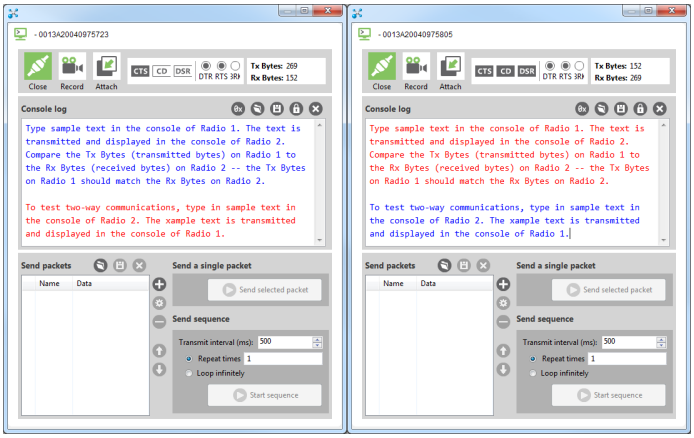
Set up radio 2

1. Power on radio 2.
2. Launch XCTU.
3. Click . The Add a radio device dialog appears.

4. Select the following:
   - **Select the serial/USB port:** Select the USB port connected to radio 2.
   - **Baud Rate:** Select 9600.
   - **Data Bits:** Select 8.
   - **Parity:** Select None.
   - **Stop Bits:** Select 1.
   - **Flow Control:** Select None.
5. Click **Finish**. XCTU discovers the XLR PRO RF modem and displays it in the list of radio modules.
6. In the list of radio modules, click the XLR PRO RF modem. XCTU reads and displays the configuration.
7. Configure the following parameters:
   - **ID:** Set the Network ID to an available network ID. For example, set the Network ID to 0xD161. You need to configure radio 2 with the same network ID.
   - **PL:** If radio 1 and radio 2 are positioned close together (that is, less than one to two meters distance between the radios), set the power level to 0 (Lowest).
   - **NI:** (Optional) Use the NI command to assign a name or description to the radio. In this way, you can easily identify the radio in XCTU without relying solely on the serial number.

Test serial communications

1. Switch both radios to console mode:
   - For radio 1, click  . Then click  to open a serial connection.
   - For radio 2, click  . Then click  to open a serial connection.
2. In the console window of radio 1, type in some sample text. The text is displayed in the console window of radio 2. To test two-way communications, type sample text in the console of radio 2, and the text is transmitted and displayed in the console of radio 1.



Step 4: Set up a range test

This section describes how to set up a pair of XLR PROs using XCTU software to perform a range test. The range test demonstrates two XLR PROs communicating at varying distances.

In these instructions, the first XLR PRO is called Radio 1 and the second XLR PRO is called Radio 2.

- **Radio 1:** Functions as the local, mobile device connected to a laptop.
- **Radio 2:** Functions as the remote device connected to a power source, but need not be connected to a PC.
- **Power sources:** You need a power source for both radios. Ideally, you can use a mobile power source (that is, a battery) for Radio 1 so that you can move the radio around. When choosing a battery, consult the XLR PRO Radio Frequency (RF) Modem User Guide for current draw requirements. If the XLR PRO is configured to use maximum power (**PL** = 4), the transmit current requirements are as follows:

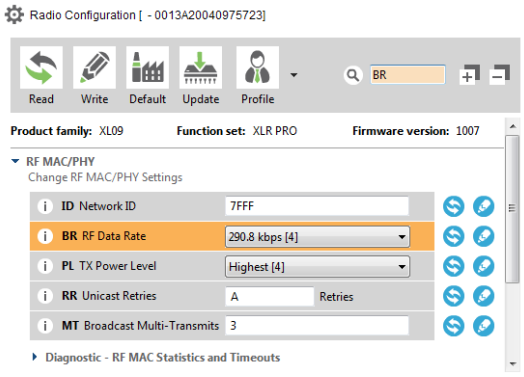
  9V: 950 mA
  12V: 840 mA
  26V: 400 mA

  If you don't have a mobile power source, you can move Radio 1 to other locations where a power source is available to demonstrate performance over particular distances.

Set up radio 1 as a mobile device

Connect radio 1 to a laptop and follow the directions in Step 3: Set up and test serial mode using XCTU on page 9 to set up a serial connection for radio 1.

1. Using XCTU:
   a. Configure the **BR** (data rate) parameter to the desired speed. Keep in mind that lower RF data rates have longer ranges.



b. Write the configuration settings.

Set up radio 2 as a remote device

1. Connect radio 2 to a PC and follow the directions in Step 3: Set up and test serial mode using XCTU on page 9 to set up a serial connection for radio 2.
2. Using XCTU:
    a. Configure the **BR** (data rate) parameter to the same rate as radio 1.

Note The **BR** parameter only affects the data rate at which the radio transmits—the radio receives on all data rates. In this test, you are transmitting and receiving with both radios, and using the same RF data rate for both radios optimizes the range.

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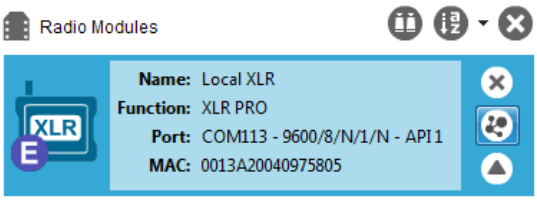
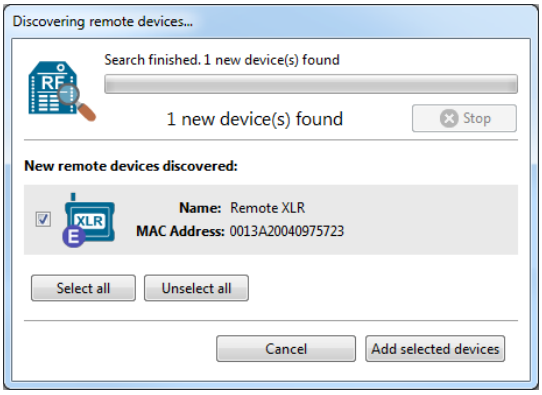
    b. Write the configuration settings.
3. At this point, you can disconnect radio 2 from the PC, but Radio 2 must remain connected to the antenna and power source.

Perform range testing

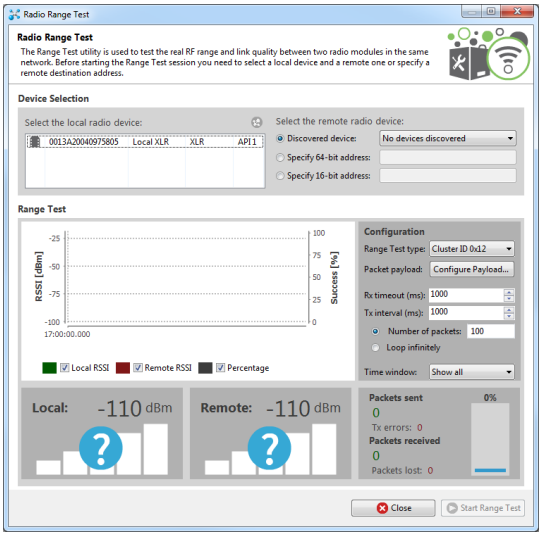
1. Go back to the XCTU display for radio 1.



2. Click  to discover remote devices within the same network. The **Discover remote devices** dialog appears.



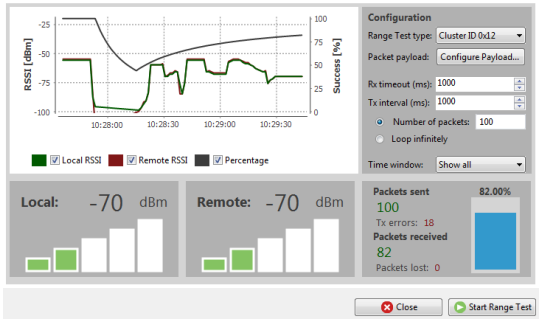
3. Click **Add selected devices**.
4. Click  and select **Range test**. The **Radio Range Test** dialog appears.



5. In the **Select the local radio device** area, select radio 1. XCTU automatically selects the **Discovered device** option, and the **Start Range Test** button is active.

6. Click Start Range Test to begin the range test.

   If the test is running properly, the packets sent should match the packets received. You will also see the received signal strength indicator (RSSI) update for each radio after each reception.



7. Move Radio 1 around to see the resulting signal strength at different distances. You can also test different data rates by reconfiguring the **BR** (data rate) parameter on both radios. When the test is complete, click **Stop Range Test**.

Step 5: Access the XLR PRO web configuration interface

This section describes how to access the XLR PRO web configuration interface to view or configure XLR PRO options. For this demonstration, you need only one XLR PRO.

Connect an XLR PRO to the network

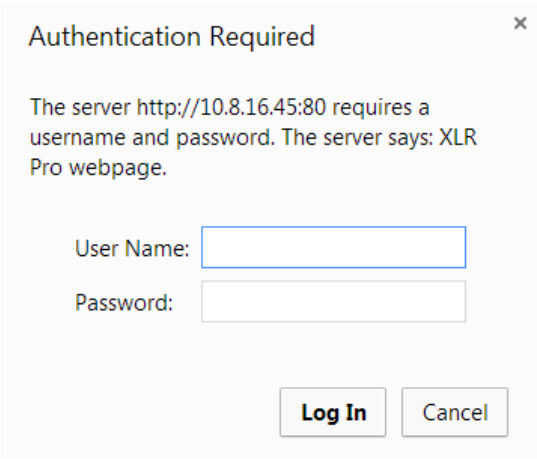
1. Follow the directions in Step 3: Set up and test serial mode using XCTU to set up a serial connection for one of the XLR PROs using XCTU.
2. Connect the XLR PRO to the network:
    a. Using a network cable, connect the XLR PRO to a network device.
    b. Allow the DHCP server to issue an IP address for the XLR PRO. This could take up to five minutes.
3. Determine the XLR PRO IP address:

    Using the serial XCTU connection, verify that an IP address has been assigned to the XLR PRO. The **MY** parameter displays the IP address. Note the IP address assigned to the XLR PRO. You'll use the IP address to access the XLR PRO web configuration interface.

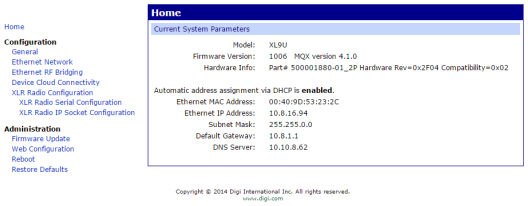
Access the XLR PRO Configuration and Management page

Browse to the XLR PRO web configuration page:

1. Open a browser and type in the IP address for the XLR PRO. The XLR PRO Web Configuration Authentication Required dialog appears.



2. Enter the default username and password. The username is **admin** and the default password is **password**.
3. Click **Log In**. The XLR PRO Configuration and Management screen appears.



You can use the XLR PRO Configuration and Management page to view or set configuration options.

Note If you have a Device Cloud account, you can add the XLR PRO RF modems to your Device Cloud inventory. For step-by-step instructions, see the *XLR PRO User Guide*.