



Quick Start Guide

XStream-PKG-R™

RS-232/422/485 RF Modem



Create Long Range Wireless Link in Minutes.

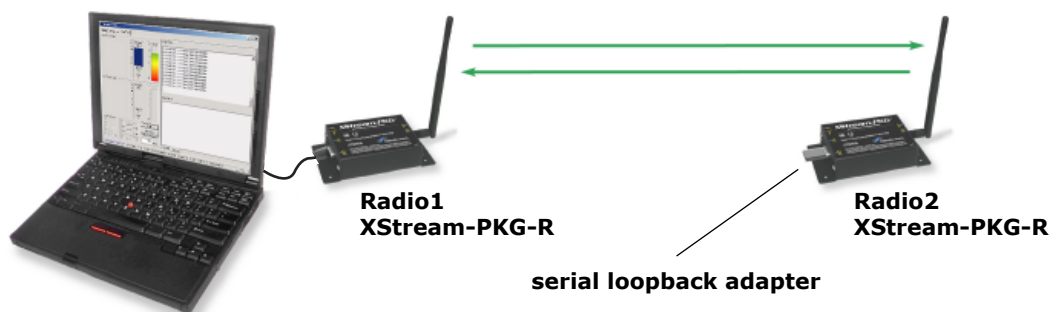
Connect Hardware

To install the modem and test its range, you need:

- **One Windows computer** with an available RS-232 (DB-9) serial com port
- **X-CTU Software:** Digi-provided software that can be used to:
 - Set up PC serial com ports to communicate with XStream RF Modems
 - Test XStream RF Modem range
 - Configure XStream RF Modem parameters

Hardware Setup

1. Set both DIP Switches to RS-232 Mode. Switch 1 is up (on) and the remaining five switches are off (down). See DIP Switch settings on page 4.
2. Connect Radio1 to a PC using an **RS-232 cable** (included with XStream RF Modem part numbers that end with an "-RA" suffix).
3. Attach the **serial loopback adapter** to the DB-9 serial port of Radio2. The serial loopback adapter configures Radio2 to function as a repeater by looping data back into the modem for retransmission.
4. Attach **RPSMA antennas** to Radio1 & Radio2.
5. **Power** Radio1 & Radio2 through their power connectors.



Install X-CTU Software

Go to the X-CTU software page at www.digi.com/xctu and launch the latest X-CTU installer. Follow the prompts on the installation screens.

Configure Serial Port-Modem Communications

Configure a serial port to communicate with the modem:

1. Launch the X-CTU Software: **Start --> Programs --> Digi --> X-CTU**
- 2 On the **PC Settings** tab, select the PC serial com port from the dropdown list that will be used to connect to Radio1.
- 3 Select the Baud rate that matches the fixed RF data rate (over-the-air baud) of Radio1. Use default values for remaining fields.

PC Settings tab

2 **PC Serial Com Port**

3 **Default Values**
 Refer to XStream RF Modem part number to determine its fixed RF data rate (baud):

X09-009...	=	9600 bps	
X09-019...	=	19200	
X24-009...	=	9600	Remaining Default Values:
X24-019...	=	19200	Flow Control = None
			Data Bits = 8
			Parity = None
			Stop Bits = 1

The screenshot shows the X-CTU software interface. The 'PC Settings' tab is active. Under 'Com Port Setup', 'Communications Port (COM1)' is selected. The Baud rate is set to 9600, Flow Control to NONE, Data Bits to 8, Parity to NONE, and Stop Bits to 1. The 'AT command Setup' section shows Command Character (CC) set to '+', Guard Time Before (BT) and Guard Time After (AT) both set to 1000, and 'Modem Flash Update' set to 'No baud change'.

Determine the RF Modem's Range

1. Click the **Range Test** tab.
- 2 (Optional) Check the box in the **RSSI** section to enable its display.
- 3 Click the **Start** button to begin range test.
4. Move Radio2 (with loopback connector) away from Radio1 to measure the modem's range.

Range Test tab

The screenshot shows the X-CTU software interface with the 'Range Test' tab active. On the left, there are buttons for 'Start', 'Clear Stats', and 'Advanced >>>'. Below them is a 'Test' section with a checked 'Loop Back' option. On the right, there is an 'RSSI' section with a color scale from -40 (green) to 0 (red) and a 'Range Test' box showing 'Good 48' and 'Bad 0'. A checkbox for 'RSSI' is checked. At the bottom, there is a 'Start' button. The terminal window shows a series of test packets.

2 **RSSI** check box
 RSSI stands for "Received Signal Strength Indicator".

3 **Start/(Stop)** button

Advanced Modem Configuration (Optional)

XStream RF Modems operate out-of-box without configuration. You can also use the **Modem Configuration** tab of the X-CTU Software to activate advanced functionality that includes the following:

- Serial Interfacing Options ("Change Baud Rate" steps shown below)
- Sleep (Low Power) Modes
- Advanced Networking and Addressing
- Diagnostics

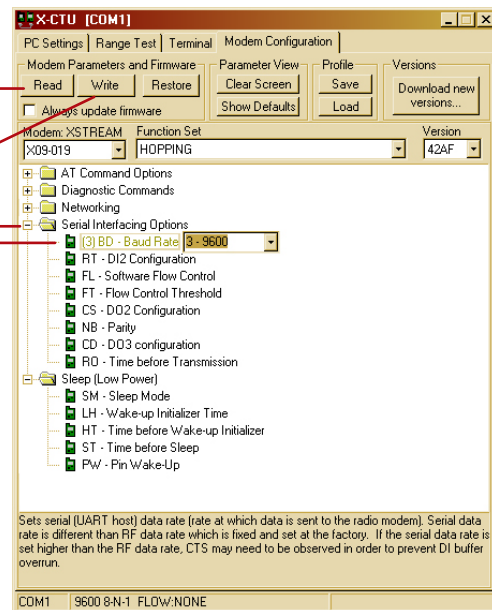
Change Serial Interfacing Baud Rate of RF Modem

OEMs and integrators can interface with XStream Modems at different baud rates than the modem defaults (though actual RF data rate is fixed). To change a modem's serial data rate, use the **PC Settings** tab to first select the PC com port baud rate that matches the modem's default [steps 1-2]. Then change the baud rate of the modem itself [steps 3-7] using the **Modem Configuration** tab. Then go back to the **PC Settings** tab and select the PC com port baud rate that matches the newly set baud rate of the modem [step 8].

1. Set up connection to a PC by following Hardware Setup steps on page 1.
2. Select the PC com port baud rate that matches the RF Modem's fixed RF data rate by following Configure Serial Port-Modem Communications steps on page 2.
3. Click the **Modem Configuration** tab.
4. Click the **Read** button.
5. In the **Command & Parameter Hierarchical Tree**, open the **Serial Interfacing Options** folder by clicking its plus (+) sign.
6. Click the **Baud Rate** entry, then select a new baud rate from the dropdown list.
7. Click the **Write** button to save new settings to the RF Modem.
8. Click on the **PC Settings** tab and select the value from the Baud dropdown list that matches the newly selected baud rate. This configures the PC Com Port to communicate at the new baud rate.

Modem Configuration tab

4. **Read** parameters button
7. **Write** parameters button
5. **Serial Interfacing Options** folder
6. **Baud Rate** dropdown list



Sets serial (UART host) data rate (rate at which data is sent to the radio modem). Serial data rate is different than RF data rate which is fixed and set at the factory. If the serial data rate is set higher than the RF data rate, CTS may need to be observed in order to prevent D11 buffer overrun.

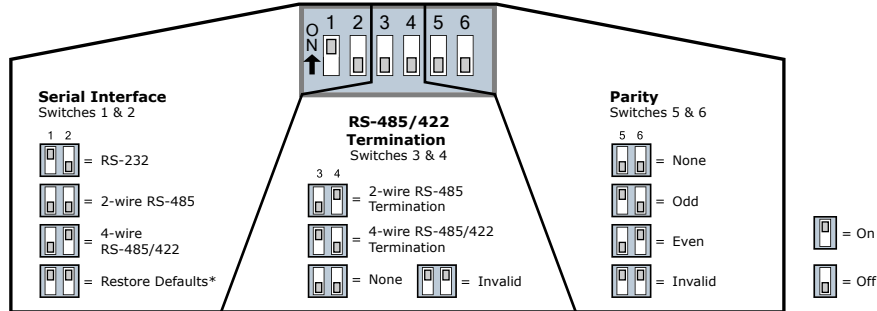
COM1 | 9600 8-N-1 FLOW:NONE

Tips and Suggestions

XStream-PKG-R DIP Switch

The XStream-PKG-R DIP Switch configures "Serial Interface," "Termination," and "Parity" command parameter settings.

DIP Switch Settings (applied only while powering on)



* The 'Restore Defaults' setting, for switches 1 & 2, can be used to restore modem parameters to their default states. (Restoration occurs after power-up) See "Restoring..." section below for more information.

Restore RF Modem to its Default Parameter Values (DIP Switch Method)

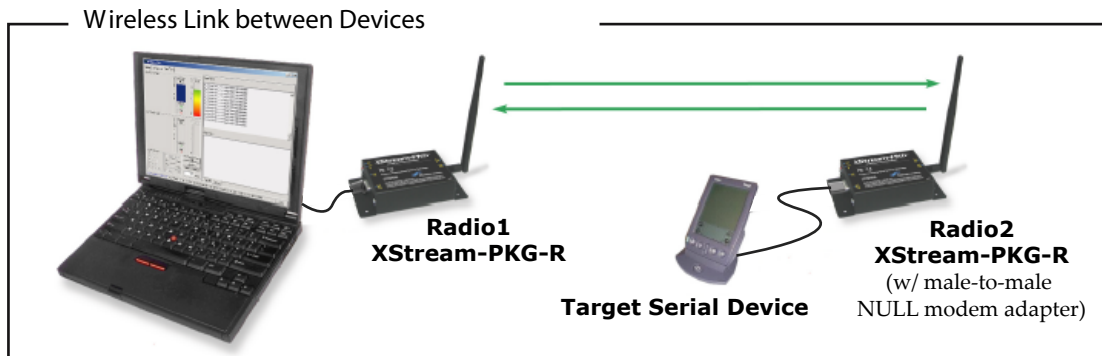
If the RF Modem is not responding or cannot enter into "AT Command Mode", restore the modem to its original settings.

1. Set switches 1 & 2 of the DIP Switch to their on (up) positions and the remaining four switches to their off (down) positions.
2. Power off the RF modem for at least one second, then on again.

Create a Wireless Link between Serial Devices

A pair of RF Modems can be used in lieu of a serial cable to create a wireless link between devices. The topology below illustrates a basic wireless strategy that can be used when connecting to target devices such as automatic meter readers, fleet management devices, remote weather stations and a host of other applications. When building a wireless link, consider the following:

- Use the **male-to-male NULL modem adapter** to connect Radio2 to a target serial device. Signals crossover inside the adapter.
- To verify serial cabling is functioning properly, insert a **female-to-female NULL modem adapter** in place of Radio1 and Radio2, then test communications without the RF modems in the link.



Contact Digi

(Office hours are 8am – 5pm U.S. mountain standard time)

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