

RN-XV-EK Evaluation Board

Features

- Evaluation board for the RN-XV module, which is based on Roving Networks' robust RN-171 Wi-Fi module
- Supports several antenna options, depending on the RN-XV module selected
- WPS pushbutton for easy configuration
- Reset pushbutton wakes the module
- Standard USB connector
- Hardware interface: USB via FTDI chipset

Applications

- Industrial metering
- HVAC control
- Room temperature sensors
- Pump configuration and control
- Telemetry
- PV/solar controllers
- Robotics



Description

The RN-XV-EK is an evaluation platform for the RN-XV module. The board connects to a PC via the standard USB cable, and provides 2 pushbutton switches to control WPS mode and to reset the module. The board has connectors to drop in the RN-XV, as well as headers that allow wires access to the RN-XV signals.

Based on a pseudo standard footprint often found in embedded applications, the RN-XV is a 802.11 b/g solution for designers who want to migrate their existing 802.15.4 architecture to a more standard TCP/IP-based platform without redesigning their existing hardware.

The RN-XV module is based on Roving Networks' robust RN-171 Wi-Fi module and incorporates an 802.11 b/g radio, a 32-bit SPARC processor, a TCP/IP stack, a real-time clock, a crypto accelerator, power management unit, and an analog sensor interface. The module is pre-loaded with firmware to simplify integration and minimize applications development time.

OVERVIEW

- Carrier board for the RN-XV module
- Contains the FTDI chipset for USB to TTL conversion
- Contains a USB miniconnector
- Contains reset and AP mode pushbuttons
- Brings the RN-XV signals out on headers for easy debugging

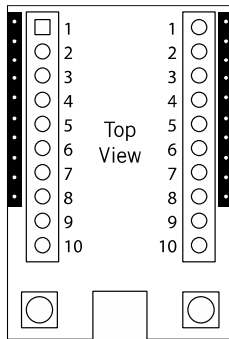
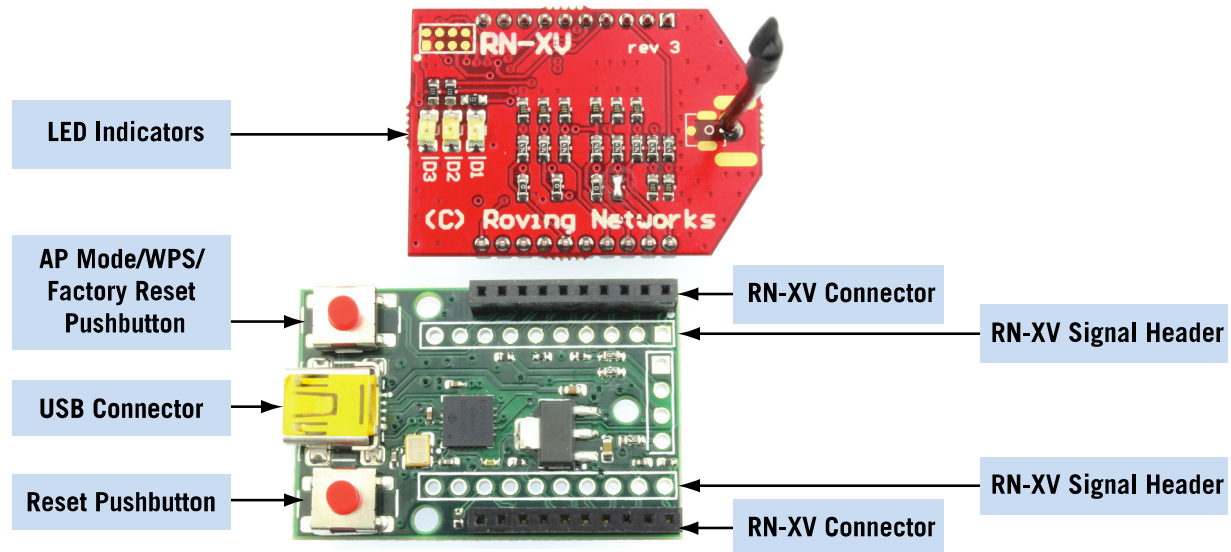
The evaluation board's moisture sensitivity level (MSL) is 1; its size and weight are:

- *Size*—1.58" x 1" x 0.25"
- *Weight*—0.22 oz

BOARD DESCRIPTION

This document describes the hardware for Roving Networks RN-XV-EK evaluation board, which allows you to evaluate the RN-XV 802.11 b/g module. The RN-XV module, which is sold separately, mounts to the evaluation board and contains the RN-171 Wi-Fi module. Figure 1. RN-XV-EK Components shows the RN-XV-EK components.

Figure 1. RN-XV-EK Components



RN-XV Interface

RX - input to evaluation board
TX - output from evaluation board

Pin	Description
1	3.3 VDC output
2	TXD
3	RXD
4	GPIO8
5	RESET
6	GPIO5
7	GPIO7
8	GPIO9
9	GPIO1
10	GND

RN-XV Interface

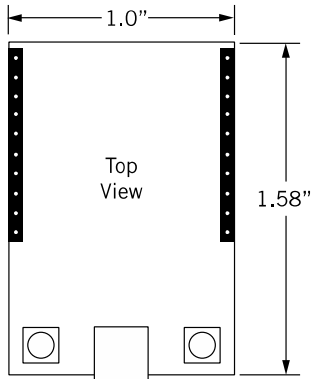
RX - input to evaluation board
TX - output from evaluation board

Pin	Description
1	Sensor 2 (3.3-V tolerant)
2	Sensor 3 (3.3-V tolerant)
3	GPIO3
4	Sensor 5 (3.3-V tolerant)
5	CTS
6	GPIO6
7	Unused
8	GPIO4
9	RTS
10	GPIO14

PHYSICAL DIMENSIONS

Figure 2 shows the evaluation board's physical dimensions.

Figure 2. RN-XV-EK Physical Dimensions



DESIGN CONCERNS

The following sections provide information on designing with the RN-XV-EK module.

Powering the Module

When plugged in, the module receives power from the PC via the USB cable.

GPIO9 Functions

The AP pushbutton is connected to GPIO9. Depending on the state of GPIO9, the module goes into three different modes: access point (AP) mode, factory reset, and WPS mode.

AP Mode

To put the module into AP mode, GPIO9 must be high when the module powers up or wakes from a sleep state. Press the AP mode button to drive GPIO9 high, and then press the reset button to reset the module. The module is in default AP mode, which creates a default access point network with the default parameters shown in Table 1.

NOTE: This default mode overwrites any software settings.

Table 1. Default AP Mode Settings

Setting	AP Mode Default
SSID	WiFiAP-XX, where XX is the last two bytes of the module's MAC address
Channel	1
DHCP server	Enabled
IP address	1.2.3.4
Netmask	255.255.255.0

Gateway	1.2.3.4
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When the module boots, other Wi-Fi-enabled devices (PC, iPhone, iPad, Android tablet, etc.) should be able to see the module when they scan for access points.

Factory Reset

In this mode, the module is restored to the factory defaults. To restore the defaults, perform the following steps:

1. Put the module into default AP mode as described in “AP Mode”.
2. Press the AP Mode pushbutton 5 times (with 1 or more seconds between presses).

The module is restored to the initial factory default configuration. This setting is useful for cases in which the module is misconfigured and is no longer responding.

WPS Mode

When the module is acting as a client (not in access point mode), you can invoke WPS functionality by pressing the AP pushbutton. Before you can invoke this mode, the WPS functionality must be enabled in software using the command **set sys trigger 0x10**.

Reset

The Reset pushbutton reboots the module. You can use the Reset and AP pushbuttons to toggle whether the module is in client or AP mode. If you press the P pushbutton before pressing Reset, the module goes into default AP mode. If you press the Reset button only, the module goes into client mode.

Drivers

RN-XV-EK board uses the FTDI chip set. When you connect the cable, the PC should install the drivers automatically. If not, you can download the drivers from the Support page on the Roving Networks website at <http://www.rovingnetworks.com/support.php>.

RESOURCES & RELATED DOCUMENTS

For more information, refer to the following sources, which are available on the Support page on the Roving Networks website at <http://www.rovingnetworks.com/support.php>:

- *RN-XV Data Sheet*
- *RN-171 Data Sheet*
- *WiFly Advanced User Manual*
- *WiFly Training Presentation*
- Drivers, tools, and utilities

ORDERING INFORMATION

Table 2 provides ordering information. For the evaluation described in this document, Roving Networks recommends purchasing the RN-XV-W, which has a ¼ inch wire antenna.

Table 2. Ordering Information

Part Number	Description
RN-XV-EK	Evaluation board for the RN-XV module.
RN-XV-W	Standard configuration, industrial temperature, 802.15.4 replacement solution with ¼ inch wire antenna. For other configurations, contact Roving Networks directly.
RN-XV-S	Custom configuration, industrial temperature (-40 °C to +85 °C) 802.15.4 replacement solution with SMA connector.
RN-XV-U	Custom configuration, industrial temperature (-40 °C to +85 °C) 802.15.4 replacement solution with U.FL. connector.
RN-USB	USB cable.

Go to <http://www.rovingnetworks.com> for current pricing and a list of distributors carrying Roving Networks products.

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