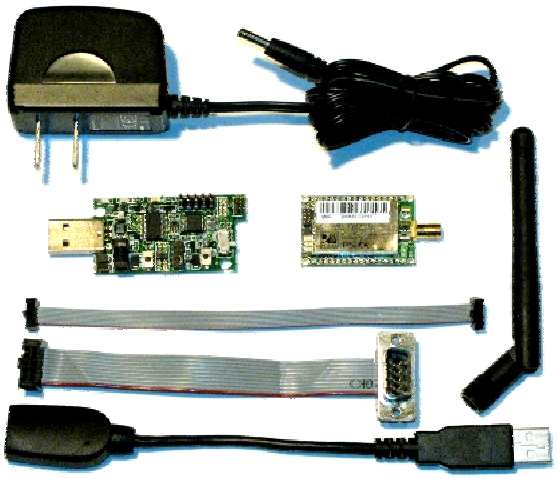
WiFly evaluation Kit



Features

- Contains all hardware and software components required to configure and setup Roving Networks WiFly 802.11 modules.
- Supprts Windows based computers via serial or USB interface.
- Simple ASCII command interface for configuration and programming of the WiFly module

Description

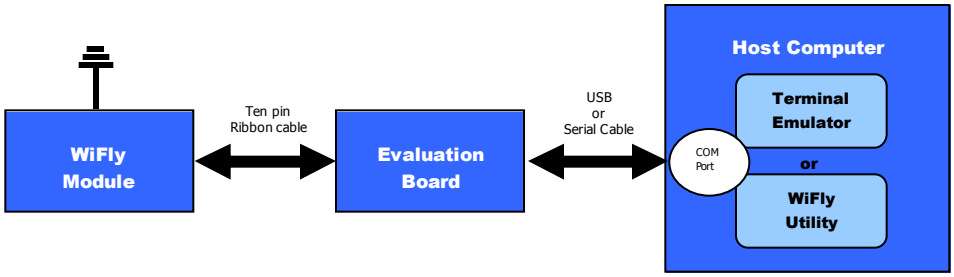
The evaluation kit allows you to configure and program the WiFly 802.11 module. The kit can be used for development and field configuration of WiFly enabled products. The evaluation kit includes the hardware required to connect to the WiFly module though the USB or serial port of your computer. The evaluation kit includes:

- evaluation board –links your computer to the WiFly module
- USB cable – connects the evaluation board to the host computer
- Serial cable – connects the evaluation board to the host computer
- Power cord – powers the evaluation board when using the serial cable (Not used for USB setups)
- 10pin (2x5) 050" board to board cable – connects the WiFly module to the evaluation board
- WiFly module – RN111B-R (Reverse polarity SMA)
- Antenna - 4" antenna with reverse polarity SMA

In addition to the hardware in the WiFly evaluation Kit you will need a x86 compatible computer with either a USB port or serial port running Windows XP or Vista. The WiFly evaluation kit may work with other versions of Windows, however this document only covers the Windows XP and Vista operation.

The WiFly device is configured with a simple ASCI command set. The evaluation board physically connects your computer to the WiFly module, communication to the WiFly module is through a standard COM port on you computer using a simple terminal emulator such as TeraTerm or through the WiFly utility. (see diagram below) A full description WiFly commands can be found in the WiFly Users Manual.

Getting Started



All software and documentation for the WiFly Module and evaluation kit can be found on the Roving Networks website on the support page.

You will need your computer, an internet connection, the SSID for your WiFi access point, the passkey(s) for your WiFi access point if your network is security enabled.

With your computer connected to the internet go to the Roving Networks website support page and download and WiFly setup wizard or FTDI drivers. The WiFly setup wizard will install the Wifly Utility and the drivers. Follow the directions in the WiFly setup wizard and be sure the wizard finishes successfully before proceeding.

NOTE: The WiFly utility is only for convenience, the WiFly module can be completely configured from a terminal emulator. If you do not use WiFly utility you will need to install the FTDI device drivers. These can be found on the Roving Networks website on the support page.

You will need a simple terminal emulator program. We suggest TeraTerm. This is also available for download from the Roving Networks website. WARNING: Don not use HyperTerm, it has several bugs that make it unusable for this application.

Setup and Configuration

This is a two step process:

1. Connecting the hardware through the USB or serial connection
2. Configuring the WiFly module to access the WiFi network

Once complete the WiFly module is associated with the network and has acquired an IP address. The WiFly module can then be programmed and network connections established.

NOTE: Before proceeding the drivers must be installed on your computer.

Step 1: Setting up the hardware

The evaluation board can be connected to the host computer using either the USB or the serial interface port on your computer.

USB Connection:

1. Connect the USB extension cable to the development board.
2. Connect the 10pin ribbon cable to the WiFly module and evaluation board. When looking from above, red side of the ribbon should be towards the edge of the module.
3. Connect the other end of the 10pin ribbon cable to the WiFly Module, again the red side of the ribbon cable should be on the outside edge of the module.
4. Verify that the jumper is set for USB mode, perpendicular to the length of the evaluation board (See figure 1)
5. Plug the USB cable into the computer.

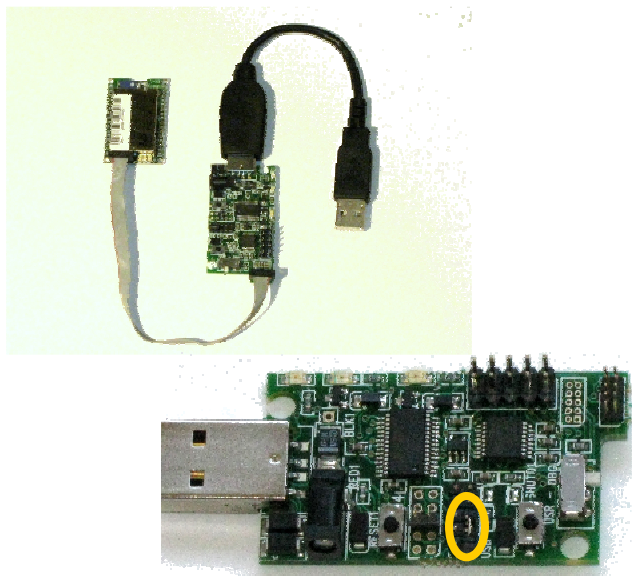


Fig. 1 USB cable setup and jumper setting

Serial Connection:

1. Connect the Serial cable to the development board. The red side of the ribbon cable should be towards the near edge of the evaluation board.
2. Connect the 10pin ribbon cable to the WiFly module and evaluation board. When looking from above, red side of the ribbon should be towards the edge of the module
3. Connect the other end of the 10pin ribbon cable to the WiFly Module, again the red side of the ribbon cable should be on the outside edge of the module.
4. Move the jumper from USB to serial mode. The jumper should be inline with the length of the evaluation board (See figure 2)
5. Plug in the power connector to the evaluation board
6. Plug the serial cable into the computer.
7. If your computer has a mail DB9 connector you will need a male to male, null modem cable to complete the connection.

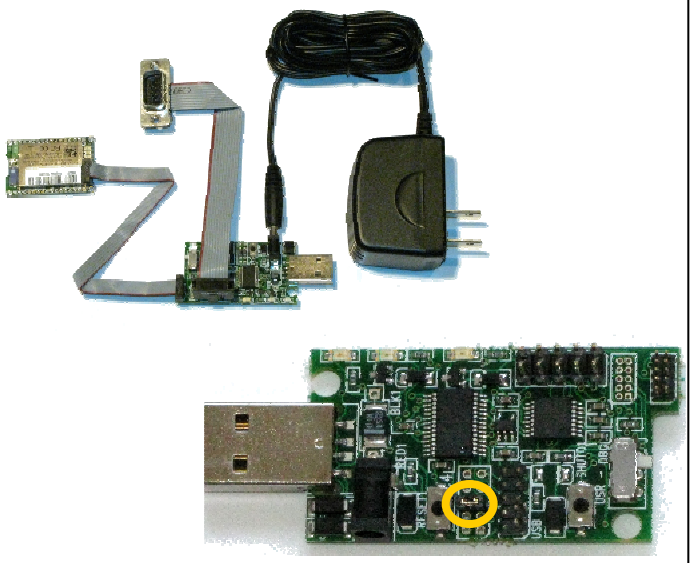


Fig. 2 Serial cable setup and jumper setting

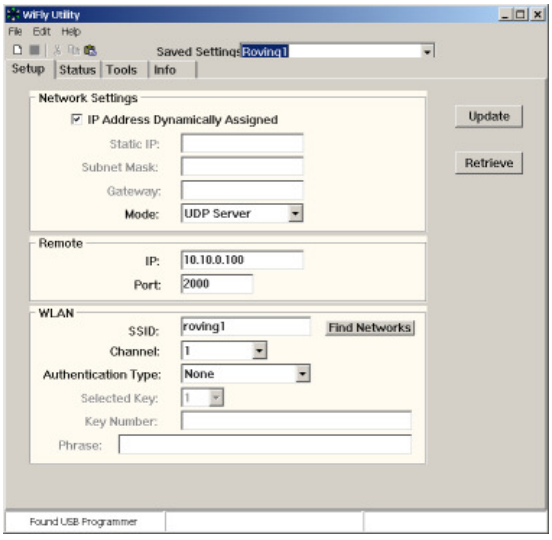
If the hardware is successfully connected, if the green LED on the evaluation board is on and the red LED on the WiFly module is on (not associated) while the green LED is blinking fast (not connected).

Step 2: Configuring the WiFly Module

The most basic configuration requires only the name (SSID) and channel of the wireless network. The WiFly module can only associate with one network at a time. It is recommended that you first configure the WiFly module using an open access point to simplify the setup.

Using the WiFly Utility to configure the WiFly module

NOTE: The WiFly utility only recognizes the USB connector setup. If you are using the serial connection you will need to us a terminal emulator program for configuration and setup.



The WiFly Utility simplifies the task configuring the WiFly module by detecting the COM port that the USB serial device is connected to and providing graphical interface for the WiFly programming language.

1. Start the WiFly Utility

   If the USB cable is plugged in and the drivers are load correctly Windows should recognize the new

hardware as "USB serial port" or "USB WiFly programmer." NOTE: If you have not installed the WiFly Utility, the Windows operating system will not recognize the new hardware. If this is the case, cancel the "Found New Hardware" dialog and disconnect the USB cable, then run the WiFly setup wizard.

2. Configuring the WiFly module
   - Enter the name (***SSID***) and ***Channel*** of your network
   - The utility requires you enter a remote ***IP*** address and ***port*** number. This does not have to be a valid IP address on your network. Set the port to 2000
   - If your network has security you must provide the security codes by selecting the ***Authentication Type*** and enter the ***Key Number*** or ***Phase***
   - Optionally if you are not using DHCP or just want to assign a static IP address
     - Deselect ***IP Address Dynamically Assigned***
     - Enter the ***Static IP*** address
     - Enter the ***Subnet Mask***
     - Enter the IP address of the ***Gateway***
   - Enter a name for this configuration at the top of the window in the ***Save Settings*** field.
   - Click on ***Update***

The WiFly module is successfully configured if the red LED is off and the green light is flashing slowly.

To verify the connection, switch to the ***Status*** tab in the WiFly Utility. There you should see the actual IP address assigned to the WiFly module, the signal strength and other information. At this point you can go to the ***Tools*** tab in the WiFly utility and ping the Wifly module by providing its IP address.

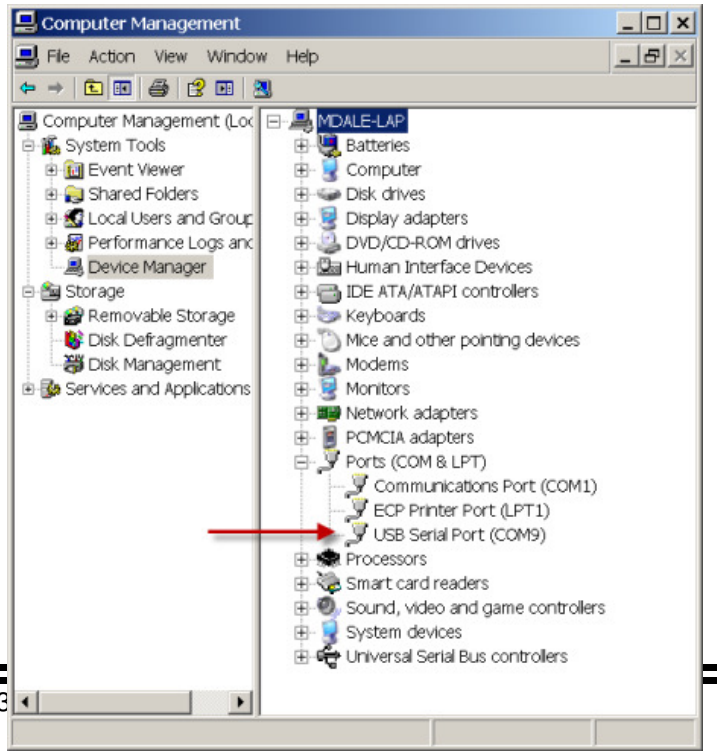
Now that the WiFly is configured it will retain these setting and every time it is powered up will attempt to associate with the same network.

Using a terminal emulator to configure the WiFly module

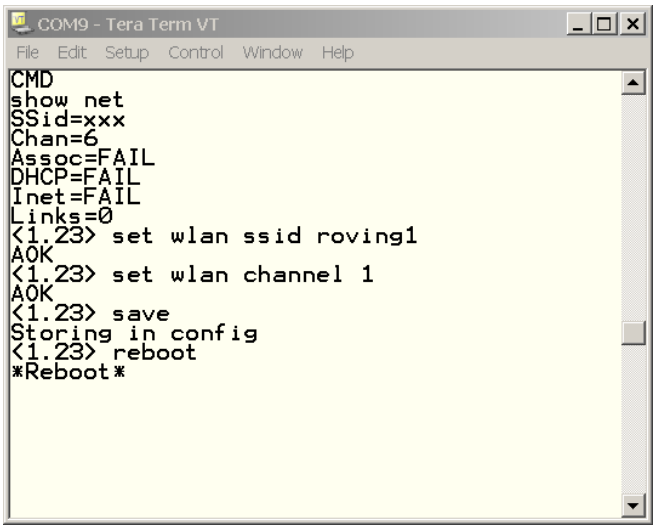
Instead of using the WiFly Utility, a terminal emulator can be used to configure the WiFly module. This has the advantage that once the module is configured the complete set of WiFly commands is available to the user.

NOTE: If you have not installed the WiFly utility or the FDTI device drivers Windows will not recognize the new hardware when it is plugged into your computer. To resolve this either running the WiFly setup wizard or install the FDTI drivers directly.

1. Determine the COM port the USB Serial port is connected on. This can be found by opening the "Device Manager" which is part of the system tools in Windows. In the Device Manager browse and expand the selection for Ports (COM & LPT) In the example to the right the USB serial port is COM9



2. Next open up the terminal emulator using COM port found in the previous step. If using TeraTerm, select ***Serial*** and choose the proper COM ***Port*** from the pull down list.



3. From within the terminal window, put the WiFly module into command mode by typing ***$$$*** in the terminal window. You should get ***CMD*** back confirming you are in command mode.
4. Next type ***show net*** to display the current network settings.

   NOTE: After each command completes you will see a prompt that looks like <X.XX> where X.XX indicates the version of firmware running on the module In the example to the right the version is 1.23

5. Set the SSID with the command ***set wlan ssid network_name*** where network_name is the name of your WiFi network
6. Set the network channel with the ***set wan channel N*** where N is the channel that your WiFi network

   NOTE: Commonly the channel number is 1, 6 or 11. If you do not know the channel number you can find it using the scan option in the WiFly, see "Finding Available Networks" below.

7. Next save the configuration to flash using the ***save*** command
8. Now reboot the WiFly module by typing **reboot** to have your changes take effect.

Upon rebooting the WiFly module will attempt to associate with the WiFi network and acquire an IP address. The WiFly module is successfully configured if the red LED is off (associated) and the green light is flashing slowly (IP address acquired).

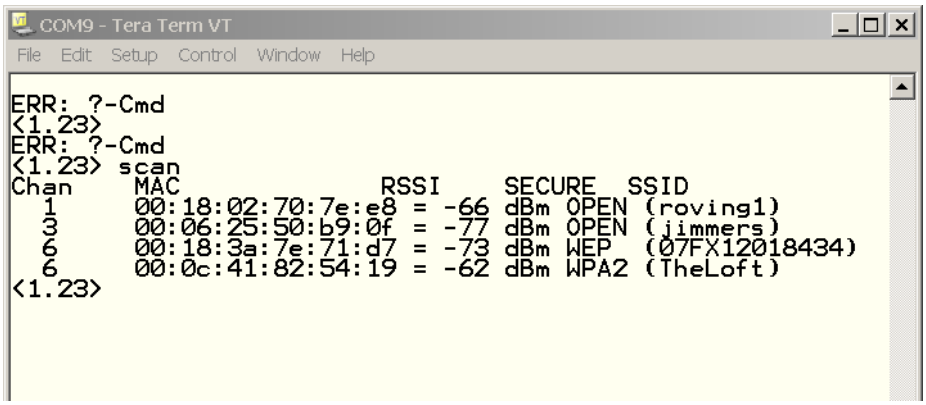
You can also verify the connection status by going into command mode and typing ***show net*** to display the network information and ***get ip*** to display the IP address.

You can test the connection by pinging the IP address of the WiFy module from an external command window.

Finding Available Networks

Use the scan feature in the WiFly module to find the name (SSID) and channel of available networks. To start the scan you must have your terminal emulator connected and the WilFy module must be in command mode.

- Type ***scan*** at the WiFly command prompt for a list of WiFi networks within range



Connecting to security enable networks

Networks running WEP or WPA security require setting the pass key prior to associating with the WiFi network. The authentication and pass keys are entered via the WiFly command interface with the following commands.

set wlan auth <value> sets the authentication level. 0= disabled, 1=WPA-PSK, 2=WPA2-PSK, 3=WEP-128.

set wlan key <num> <value> sets the WEP key. The key parameter must be

EXACTLY 13 bytes (26 ASCII chars). Data is expected in HEX format, "0x" should NOT be included.

Example : "set w k 11223344556677889AABBCCDD"

Hex digits > 9 can be either upper or lower case.

set wlan num <value> sets the default WEP key to use. 1-4 is the valid range.

Example : "set w n 2" sets the default key to 2.

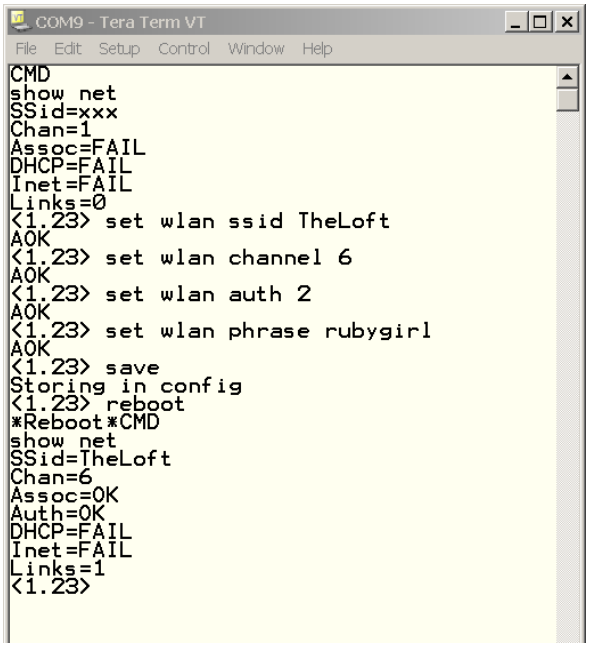
set wlan phrase <string> sets the passphrase for WPA security modes.

1-64 chars. The passphrase can be alpha and numeric, and is used along with the ssid generate a unique 32 byte Pre-shared key (PSK), which is then hashed into a 256 bit number.

However, if exactly 64 chars are entered, it is assumed that this entry is already anASCII HEX representation of the 32 byte PSK and no such processing is done.

Example : "set w p password" sets the phrase.

Here is an example of connecting to a WPA-2 secure access point.



Trouble Shooting

WiFly Utility error “Can not find sensor: Timeout”

The evaluation board is not connected. Check to make sure the jumpers are correctly set for USB or Serial connection.

WiFly Utility error “Command scan: Timeout”

The Wifly module is not able to find any networks in range. Check that the WiFly utility Channel field is set to Auto Find. Make sure the network access point as good signal strength

WiFly Utility error “No Networks Found”

The Wifly module can not connect to the networks. Possible problems include, no access points available, check with wireless device manager. Incorrect or missing WEP key, confirm access point is either open (no security) or you have the right authentication level set and the correct pass phrase or key.

WiFly module red LED remains on after setting SSID and channel

The Wifly module can not connect to the networks. Possible problems include, not saving the configuration before rebooting, enter command mode and verify settings. Incorrect or missing WEP/WPA keys, confirm access point is either open (no security) or you have the right authentication level set and the correct pass phrase or key.

WiFly Module red LED is off, but green LED is flash quickly

The WiFy module is associated with the network but was unable to get an IP address. Check the DHCP is ON in WiFly configuration. If using a static IP address make sure the sub-net mask and the gateway IP addresses are set correctly using the ***get ip*** command

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