



## **WiFLY SERIAL ADAPTER** **RN-370 & RN-374**

Battery Powered 802.11 b/g Serial  
Adapter

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*Install Guide and User Manual*  
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## Overview

The Battery powered WiFly Serial Adapter supports either RS-232 (RN-370) or RS-422 (RN-374) interfaces. When connected to a remote host, the WiFly serial adapter transfers data read or written to the serial interface to a remote application such as an iPhone app, data logger or PC control console. Data is transferred over a reliable TCP/IP socket. 802.11 b/g infrastructure or adhoc networking has the advantage of using existing, low cost wireless connectivity and being able to remotely connect to any WiFly serial adapter in the world.

The WiFly serial adapter is powered by two AAA batteries, an external AC to 5VDC power brick, or 5VDC (only !) on pin 9 of the DB9 connector. Rechargeable NiMH batteries will be trickle charged when used with an external 5VDC (only !) power source. The WiFly Serial Adapter will run for up to 8 hours while connected over WiFi on a fully charged set of batteries.

Since Apple Computer requires an additional Bluetooth authorization co-processor for any and all devices connecting to the iPhone, using the WiFi serial adapter in adhoc mode is a simple and cost effective way to connect to iPhone apps. The WiFly Serial Adapter is more than a cable replacement solution. By allowing multiple TCP/IP sockets, applications can control and monitor hundreds of Wifi Serial adapters remotely distributed across a building LAN or campus WAN.

Other usage modes can be setup. When configured in auto connect mode, the WiFly Serial Adapter will connect out to a pre-stored IP address whenever data is written to the serial port. The WiFly Serial Adapter can also be set to automatically go to sleep once idle, and wakeup based on time delay, or UART RX data or state change of CTS signals.

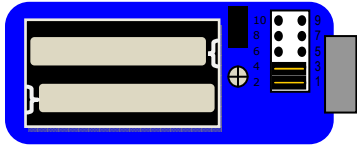
## Powering up the WiFly Serial Adapter

The red button on the top of the WiFly Serial Adapter is a soft ON/OFF switch. The WiFly Serial Adapter can be powered from batteries or from the external power connector.

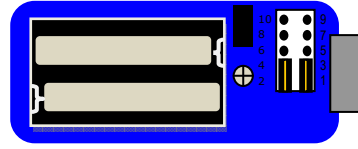
**Warning: Do NOT use alkaline batteries when connecting the external power. Doing so will cause permanent damage. The WiFly Serial Adapter will operate on 5VDC power with no batteries installed.**

To turn ON the WiFly Serial Adapter, press down the red button for 1 second, then release it. You will see the green, yellow, red and blue LEDs flash in succession. After a moment the blue and yellow LEDs will go OFF, leaving the red and green LED flashing.

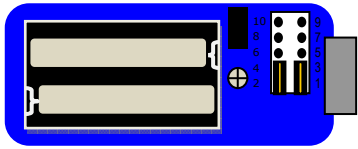
Male DB9 (Default Config)  
Jumper 1<>2, 3<>4



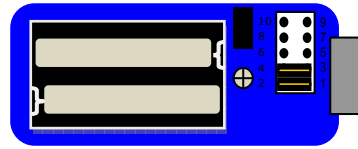
Male DB9 - Null Modem  
Jumper 2<>4, 1<>3



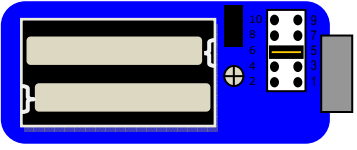
Female DB9 (Default Config)  
Jumper 2<>4, 1<>3



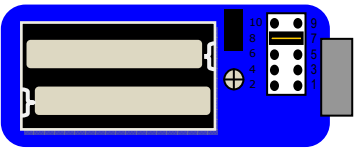
Female DB9 - Null Modem  
Jumper 1<>2, 3<>4



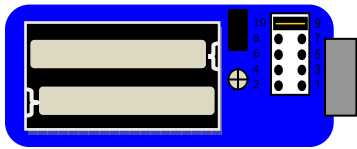
Drive DSR on pin 6 of the male DB9  
Jumper 5<>6



Drive DTR on pin 4 of the male DB9  
Jumper 7<>8



Drive DCD on pin 1 of the male DB9  
Jumper 9<>10



To turn OFF the WiFly Serial Adapter, press down on the red button for 1 second, then release it. The green, yellow, red and blue LEDs flash in succession several times. Then All the LEDs will turn off and the device will be in sleep mode.

By default the WiFly Serial Adapter automatically shuts itself off if not connected for more than 3 minutes = 180 seconds. The sleep timer duration is controlled by using the **set system sleep <seconds>** command. Use the **get sys** to display the current settings of the sleep timer.

## Batteries and Charging

**Only use NiMH rechargeable batteries (or no batteries) when externally powering the WiFly Serial Adapter.** Applying power with alkaline batteries will damage the device and could cause a fire hazard.

The red LED near the power connection comes on SOLID when external power is present. When turning on the WiFly Serial Adapter a BLINKING blue LED indicates low battery. Battery life between charges depends on use. With typical usage you should get at least 8 hours of continuous use between charges. Enabling sleep modes can extend the battery life.

External power can be applied from either the 5 VDC plug or pin 9 on the DB9 connector. The power plug is center pin positive, outer cylinder GND. Input **MUST be 5 VDC** for proper battery charging. Higher voltages can permanently damage the charger and battery.

In configuration mode the **show bat** command will return the current battery voltage. Note that with rechargeable NiMh batteries the voltage will remain relatively unchanged just until they go dead.

## Status LEDs

State	Green LED	Yellow LED	Red LED	Blue LED
ON solid	Connected over TCP			Full charge
Fast blink	No IP address or Config Mode		Not Associated	Rx/Tx data transfer
Slow blink	IP address OK		Associated, No Internet	Low Power
OFF			Associated, Internet OK	

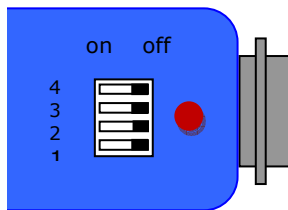
The blue LED blinks when data is sent or received on the serial interface. This does not indicate that the data was sent over the WiFi connection. If the blue LED is not flashing and your device is sending data to the serial port, you likely have a connection, incorrect baudrate, or HW flow control (RTS/CTS) problem.

The blue LED also indicates battery status and will blink slowly when the batteries are low except when charging. When charging the blue LED remains off. If the device is on while the batteries are charging the blue LED will come solid when the batteries are fully charged

When using switch1 to enable adhoc mode, after the device powers on, all LEDs will blink in succession from green to blue. This does not occur when adhoc mode is set through software.

There is an additional red LED near the power connector that indicates external power is present at either the power plug of DB9 connector.

## Configuration Switches



The configuration switches on the top of the WiFly Serial Adapter are small. You will need a paper clip or small screw driver to change them. Hold the devices with the DB9 connector facing to the right, the switches are numbered one to four from bottom to top. The off position is towards the DB9 connector.

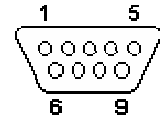
### Switch 1 – Adhoc and restoring factory defaults

With this switch ON, the device powers up in adhoc mode. The SSID of the adhoc network will be Wifly-GSX-NN where NN is the last two digits of the devices mac address.

To restore factory defaults, power on the device with this switch ON, then toggle the switch five (5) times. If there is a config file named "user" on the WiFly Serial adapter file system, it is read in as the factory defaults instead of using the hardcoded defaults. If no "user" config file is present, the hardcoded factory defaults are used.

## Serial Connector Specification

### DB9 connector Pin Out



Pin	RN-370M Male DB9	RN-370F Female DB9	RN-374M Male DB9
1	NC	NC	NC
2	RXD	TXD	NC
3	TXD	RXD	RXD-
4	NC	NC	TXD+
5	GND	GND	GND
6	NC	NC	+5 VDC (input)
7	RTS	CTS	RXD+
8	CTS	RTS	TXD-
9	4-12VDC	4-12VDC	NC

NOTE: The RS422 interface uses the MAX490 transceiver. This device is designed to operate with input voltage range of 4.75 to 5.25 VDC.

RXD+ and TXD+ each have a 4.7K pull up to 5VDC.  
RXD- and TXD- each have a 4.7K pull down to GND.

NOTE: The RS232 interface uses the SIPEX SP3232ECA chip with capacitor switch to generate the + and - signals and thus is not driving the full RS232 voltages. Devices stealing power from the RS232 pins may not have enough voltage.

### Null modem and Flow control Jumpers

The WiFly Serial Adapter 370M serial interface can be configured to enable flow control and null modem signaling. The Jumper block is accessed by removing the battery cover from the WiFly serial adapter.

WARNING: flow control signals are NOT RS232 signaling tolerant. If these are enabled with the jumper do not exceed 3.3 VDC or permanent damage can occur.

## Low Power Mode

The "user" config file is created using the "**save user**" command which saves the current configuration settings.

Even if there is a "user" config file arming and toggling this switch seven (7) times will override the "user" settings and restore the wifly module to the factory hardcoded defaults. This is a bypass mechanism in case a bad configuration is saved into the "user" file.

### **Switch 2 – Sensor pin 2**

Currently not used

### **Switch 3 – Sensor pin 3**

Currently not used

### **Switch 4 – Sensor pin 7**

Currently not used

## WiFi Connections

The WiFi serial adapter is used to create a WiFi connection to a variety of application, some examples are:

- Remote environmental sensors
- Linking mobile devices like GPS and light sensors
- Automotive diagnostics
- Industrial equipment monitoring and control

The WiFly Serial adapter can be configured in a **Point to point (Adhoc) or Infrastructure Networking setup**. In the point to point setup the WiFly serial adapter is connected via adhoc to an iPhone, Smartphone or laptop computer to download the data or control a remote device through the serial interface.

With the Network setup the WiFly Serial Adapter associates with an access point and is reachable from any machine on the LAN. You can extend this access to anywhere on the internet by using Dynamic DNS. The Network setup is useful when the WiFly serial adapter is making connections to a server and uploading data.

### **Creating a Point to Point setup**

The WiFly Serial adapter can be configured for adhoc network via hardware or software commands. In Adhoc mode the device looks like access point so that other WiFi devices to join WiFly adhoc network and open connections to the WiFly serial adapter.

Note: currently the WiFly only supports OPEN mode for creating adhoc networks.

Adhoc mode can be enabled via hardware or software configuration. To enable Adhoc mode via hardware turn ON external switch 1. When the module powers up the LEDS will blink in sequence and an adhoc network will be created with the following

SSID: WiFly-GSX-XX where XX is the final two bytes of the devices MAC address

```
Channel:      1
DHCP:         OFF
IP address:   169.254.1.1
Netmask:     255.255.0.0
```

When Switch 1 is ON the above settings override any set configuration settings.

To enable adhoc mode from software configuration, enter into command mode and set the follow configuration. Adhoc mode is turned on by setting the join mode to 4. You will also need to set the ssid and channel.

```
set wlan join 4
set wlan ssid my_adhoc_network
set wlan chan 1
```

Turn off DHCP and set the IP address and netmask so other devices know where to connect to the adhoc WiFly GSX. Since auto IP fixes the first two bytes of the IP address you want to use the netmask of 255.255.0.0 so that other device connecting to the module can be reached. Alternatively you can set the netmask to a smaller subnet if the other device's IP addresses are begin statically to the same subnet as the adhoc device

```
set ip address 169.254.1.1
set ip netmask 255.255.0.0
set ip dhcp 0
```

Be sure to save your configuration, then upon reboot the module will be in adhoc mode.

To associate with the WiFly serial adapter from an iPhone, Smart phone or computer. Open the dialog box or window that shows the available networks.

## ftp update <name>

Updates firmware with the latest release. Deletes the backup image, retrieves new image and updates the boot image.

should be set with the **set ip gateway** **<addr>** command

### **ping h**

pings the stored host IP address, the host IP address can be set with the **set ip host** **<addr>** command

### **reboot**

forces a reboot of the device (similar to power cycle)

### **scan <time>**

Performs an active probe scan of access points on all 13 channels. Returns MAC address, signal strength, SSID name, security mode.

Default scan time is 200ms / channel = about 3 seconds.

**time** is an optional parameter, this is the time in ms per channel.

For example, "scan 30" reduces the total scan time down to about 1 second. This command also works in Adhoc mode (version 2.11).

### **time**

Sets the Real time clock by synchronizing with the time server specified with the time server parameters (see section 0) This command sends a UDP time server request packet

## **FILE IO Commands**

### **load <name>**

Reads in a new config file.

### **ls**

Displays the files in the system

### **save**

Saves the configuration to "config" (the default file).

### **save <name>**

Saves the configuration data to a new file name

### **boot image <num>**

Makes file <num> the new boot image.

On the iphone this is in the *settings* icon. On Microsoft Windows this is the "Control Panel / Networking and Sharing / Networking and Sharing Center" dialog.

Find the name of the WiFly Serial Adapter adhoc network in the list of available networks and select it to associate.

Note: Once associated with the adhoc network, (since there is likely no active DHCP server) Auto-IP is used. This may take a couple minutes to allocate an IP address for your computer. To work around this you can assign a static IP address in the network settings / TCP/IP / Properties menu.

Once associated with the adhoc network you can open a connection or telnet window as you would with an infrastructure mode connection. See the section below "**Opening a Connection**"

Note: The module does not support adhoc and enterprise network modes simultaneously.

### **Creating a network setup**

From command mode you can view available network, associate to a network and see status of the network connection.

To find all available networks use the **scan** command.

If the access point you're associating with is running in open mode (no security) you can simply use the **join my\_network** command to associate with it.

If the access point is security enabled you will need to set the pass phrase (WPA modes) or key (WEP modes) prior to issuing the **join** command. The WiFly Serial adapter will inquire and determine the security protocol used by the access point so you do not have to set the authentication mode. To set the pass phrase for WPA use the command **set wlan phrase <string>**. For WEP set the key using the **set wlan key <num>** command.

To configure the WiFly serial adapter to remember network, use the command set **wlan ssid my\_network**. Next save the SSID and Pass Phrase/Key to the configuration file using the **save** command. Next time the device powers up it will use the save network information to associate with the network.

```
set wlan ssid      my_network
set wlan phrase    my_secret_code
save
reboot
```

For security reason you may want to hide the Pass Phrase/Key. This is accomplished using the **set wlan hide** command. To un-hide the Pass Phrase, reset the key or passphrase.

## Action Commands

<b>\$\$\$</b>	enter command mode Characters are PASSED until this exact sequence is seen. If any bytes are seen before these chars, or after these chars, in a 250ms window, command mode will not be entered and these bytes will be passed on to other side.
<b>close</b>	disconnect a TCP connection.
<b>exit</b>	exit command mode. Exit command mode. "EXIT" will be displayed.
<b>factory RESET</b>	Loads factory defaults into the RAM configuration. <b>Note that the RESET must be capitalized.</b> After this command the new settings must be save to the config file using the <b>save</b> command and the module rebooted for them to take effect.
<b>join &lt;ssid&gt;</b>	joins the network <ssid>. If network is security enabled you must set the pass phrase with the <b>set wlan phrase</b> command prior to issuing the <b>join</b> command
<b>leave</b>	disconnects from currently associated Access Point.
<b>open &lt;addr&gt; &lt;port&gt;</b>	opens a TCP connection to the given IP port and address. If no arguments are provided, the device will attempt to connect to the <b>stored</b> remote host IP address and remote port number. <addr> can also be a DNS hostname and will be resolved if entered.
<b>Ping &lt;g   h   i   addr&gt; &lt;num&gt;</b>	ping remote host. Default sends 1 packet. Optional <num> sends <num> pings at 10 per second.  <b>Ping 10.20.20.12 10</b> – pings IP address 10 times
<b>ping g</b>	pings the gateway, the gateway IP address is loaded if DHCP is turned on, otherwise it

For example, if the ssid of the AP is "yellow brick road"

You would enter "yellow\$brick\$road"

Using the `get w` command will properly display the value:  
SSID=yellow brick road.

## Display commands:

<b>get everything</b>	displays all configuration settings, useful for debug.
<b>get com</b>	display comm. settings.
<b>get ip</b>	display IP address and port number settings.
<b>get optional</b>	display the optional settings like device ID
<b>get sys</b>	display system settings, sleep, wake timers, etc.
<b>get time</b>	display the time server UDP address and port number.
<b>get wlan</b>	display the ssid, chan, and other wlan settings.
<b>get uart</b>	display the UART settings.
<b>show battery</b>	Displays current battery voltage
<b>show net</b>	Displays current network status, association, authentication, etc.
<b>show stats</b>	Displays current statistics, packet rx/tx counters, etc.
<b>show time</b>	Displays number of seconds since last powerup or reboot
<b>ver</b>	return the software release version

## Connection Modes

Two common modes of operation for the Wifly Serial adapter are A: initiating a connection to a server and B: listening for a remote host connection. This section will go through the configuration for each of these setups. The set ups are shown using infrastructure network. i.e. with an access point, however the same can be done with adhoc networking.

### Initiating a connection from the WiFly serial adapter

Step 1: Set up the wlan properties so the device will connect to the network automatically upon power up. In this example we want to connect to the wireless network my\_network.

```
set wlan join 1           // Auto join upon power up
set wlan chan 0          // Scan all channels
set wlan ssid my_network // Network name
set wlan phrase my_secret_code // Pass phrase
```

The **join 1** setting ensures that when the module wakes up, it tries to join the access point that matches the stored SSID, passkey and channel. Channel =0 (the default) will force auto-scanning. Setting the channel will reduce the time it takes the WiFly to find and associate.

Step 2: Set up the IP address and port number of the remote server, so the WiFly serial adapter can connect when it wakes up.

```
set ip host 10.20.20.75 // Set the host IP address
set ip remote 3000      // Set the remote port
set sys autoconn 2     // Try to connect to the host every 2 seconds
save                   // Save configuration>
```

Note: If autoconn=1, the WiFly will only make one attempt to auto connect.

Step 3: Set the wake up and sleep conditions. By default the serial adapter will wake whenever there is data written to the serial interface. You can also configure the device to wake up on CTS, on a PIO or timer. See the WiFly GSX user manual for details. We are going to set this up to wake on a timer then sleep after 2 minutes if there is no connection or if connected and no data has been transferred for 30 seconds.

```
set sys sleep 120       // sleep after 2 minutes if no connection
set sys trigger 2       // wake on CTS
```

```
set conn idle 30           // disconnect after 30 seconds of no data
save                       // save all the settings to the config file
reboot                    // use the new settings
```

This setup can be tested using TCP server application that opens a socket on port 3000. Port Peeker is a free application that you can download off the web. It is available at <http://www.linklogger.com/portpeeker.htm>

### Waiting for the remote host to connect to the serial adapter (listen mode)

In this example we are using a static IP so that the remote host knows where the WiFly Serial adapter is on the network. Alternatively you can write your application software to listen for the broadcast UDP packet (automatically sent by WiFly by default) to identify the WiFly Serial adapter and get the IP address and TCP port number that the WiFly is listening on.

Step 1: Set up the wlan properties so the device will connect to the network automatically upon power up. In this example we want to connect to the wireless network my\_network.

```
set wlan join 1           // Auto join upon power up
set wlan chan 1          // only look on channel 1
set wlan ssid my_network // Network name
set wlan phrase my_secret_code // Pass phrase
```

Step 2: Configure the WiFly static IP address so the remote application can connect, turn off DHCP and set the IP address and netmask.

```
set ip address 10.20.20.63 // Set the IP address
set ip port 5030           // Set the local port to listen on
set ip netmask 255.255.255.0 // Set the IP netmask
set ip gateway 10.20.20.1 // Sets the network gateway
set ip dhcp 0             // Turn off DHCP
```

Step 3: Set the wake up and sleep conditions. In this mode the sleep and wake timers are used to conserve battery. Since we don't know when the remote host will connect, the module should occasionally wake up and listen for the remote host. The trade off with these timers is the longer you sleep the better battery performance but the longer the latency the remote host sees when

The Wifly GSX only supports "open" key mode, 128 bit keys for WEP. WEP-128, shared mode is not supported as it is known to be easily compromised and has been deprecated from the WiFi standards.

### set wlan mask <value>

sets the wlan channel mask used for scanning channels with the auto-join policy 1 or 2, used when the channel is set to 0. Value is a bit-map where bit 0 = channel 1. Input for this command can be entered in decimal or hex if prefixed with 0x. Default value is 0x1FFF (all channels)

### 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 and WPA2 security modes. 1-64 chars. The passphrase can be alpha and numeric, and is used along with the SSID to generate a unique 32 byte Pre-shared key (PSK), which is then hashed into a 256 bit number. Changing either the SSID or this value recalculates and stores the PSK.

If exactly 64 chars are entered, it is assumed that this entry is already an ASCII HEX representation of the 32 byte PSK and the value is simply stored.

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

### set wlan ssid <string>

sets the wlan ssid to associate with. 1-32 chars.

NOTE: If the passphrase or ssid contain the SPACE ( ` ` ) characters, these can be entered using substitution via the "\$" character.

	scanning. (Default)
2	Join ANY access point with security matching the stored authentication mode. This ignores the stored SSID and searches for the access point with the strongest signal. The channels searched can be limited by setting the channel mask.
3	Reserved – Not used
4	Create an Adhoc network, using stored SSID, IP address and netmask. Channel MUST be set. DHCP should be 0 (static IP) or set to Auto-IP with this policy. (unless another Adhoc device can act as DHCP server) This policy is often used instead of the hardware jumper to creat a custom Adhoc network

**set wlan hide <0, 1>**

Hides the WEP key and WPA passphrase. When set, displaying the wlan settings shows \*\*\*\*\* for these fields. To unhide the passphrase or passkey, re-enter the key or passphrase using the set wlan key or set wlan passphrase command. Default = 0, don't hide.

**wlan key <value>**

sets the 128 bit WEP key. If you are using WPA or WPA2 you should enter a pass phrase with the set wlan passphrase command. Key must be EXACTLY 13 bytes (26 ASCII chars). Data is expected in HEX format, "0x" should NOT be used here.

Example : "set w k  
112233445566778899AABBCCDD"

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

connecting. WARNING: do not set the sleep timer below 5 seconds or it will be impossible to get into command mode to reprogram this mode without it going back to sleep.

```
set sys wake 20           // Wake after 20 seconds
set sys sleep 10         // Go to sleep after 10 seconds

save                       // Save configuration
reboot                     // restart using the new configuration
```

At this point you could test this configuration using telnet on a computer sharing the same network to connect to the WiFly serial adapter.

## Device Configuration

The WiFly Serial adapter can be thought of as a data pipe. Any data read or written into the serial interface appears on the TCP/IP socket and vice versa. Configuration is accomplished over the same data pipe. You enter command mode with the three character escape sequence, \$\$\$\$. While in configuration mode all characters sent over the data pipe are interpreted by the WiFly Serial adapter as command. The "exit" command returns the device to data transfer mode.

The WiFly module can be configured both locally through the Serial connection with a terminal emulator or remotely over the air via a Telnet connection. Serial configuration is the simplest in that you do not have to set adhoc mode and associate with the network.

NOTE: We suggest using TeraTerm. It has both a terminal emulator and Telnet capability. This is available for download from the Roving Networks website. <http://www.rovingnetworks.com/support/teraterm.zip>

### Local configuration over the serial port

Connect the WiFly Serial Adapter to the serial port your computer. You may need a null-modem cable (DB9 pins 2 and 3 swapped) if you have a RN-370M or a straight cable if you have a RN-370F. If your computer does not have a serial port you can use a USB serial cable such as the RN-USB-SERIAL to connect the WiFly Serial Adapter to your computer.

The RN-374 will require a RS422 to RS232 converter or RS422 to USB cable to connect the WiFly Serial Adapter to your computer.

- With the WiFly Serial Adapter connected and powered on, locate using

the device manager which COM port the serial interface or serial USB is connected to.

- Next open up a terminal emulation program specifying the COM port found in the previous step. If using TeraTerm, select **Serial** and choose the COM **Port** from the pull down list.

Note: the default serial port setting is 9600, 8 bit, no parity.

- From within the terminal window, put the WiFly GSX module into command mode by typing **\$\$\$** in the terminal window. You should get **CMD** back confirming you are in command mode.

## Remote connection over the air via a Telnet

First you must create an adhoc network and join the network from your computer. Once the computer is on the same network you can open the telnet connection to the module. Use ping to see if the Wifly serial adapter can be seen on the network from the computer.

- Enable adhoc mode by turning on switch 1, power on the WiFly Serial adapter.
- Associate to the Adhoc network from your computer. Use ping to verify the WiFly serial adapter is visible on the network.
- Start TeraTerm and select the TCP/IP radio button. You will need to set the IP address of the module which will be 169.254.1.1. Also select the Telnet radio button and set the port to 2000. Hit OK
- The module will reply with the string **\*HELLO\*** indicating that the connection has been established.

## Getting into command mode

Type **\$\$\$** (3 dollar signs) into the terminal emulator or telnet window, you should see **CMD** returned to you. If you see **CMD** you know that your connection and terminal settings are correct.

Entering **<CR>** command returns a prompt **<x.xx>** where x.xx is the version number of the firmware running. Invalid syntax returns **ERR: ?-Cmd**, and incorrectly formatted commands return **ERR: Bad Args** or **ERR: 2few Args**

To exit command mode type **exit**. You will see EXIT echoed to indicate the module is in data mode.

Example : "set u b 9600" sets the baud rate to 9600 baud.

NOTE: the RS-232 interface on the RN-370 does not work reliably above 230400

### set uart instant <rate>

This immediately changes the baudrate. This is useful when testing baudrate settings, or switching baudrate "on the fly" remotely while connected over TCP. This setting does not affect configuration. Returns the AOK response, and then this command will exit command mode.

### set uart raw <rate>

sets a RAW UART value. Used to set non-standard rates. The lowest possible baud rate is 2400.

Example : "set u r 7200" sets the baud rate to 7200 baud.

### set uart flow <0,1>

sets the flow control mode. Default=0=off, 1= hardware RTS/CTS.

*NOTE: Due to an issue in the UART hardware, the UART does not support even or odd parity.*

## WLAN Parameters

### set wlan channel <value>

sets the wlan channel, 1-13 is the valid range for a fixed channel. If 0 is set, then scan is performed, using the ssid, for all the channels set in the channel mask.

### set wlan join <value>

sets the policy for automatically joining/associating with network access points. This policy is used when the module powers up, including wake up from the sleep timer.

Value	Policy
0	Manual, do not try to join
1	Try to join the access point that matches the stored SSID, passkey and channel. Channel can be set to 0 for

## TIME Server Parameters

- set time address <addr>** sets the time server address. (sNTP servers)
- set time port <num>** sets the time server port number. Defaults to 123 which is almost always the sNTP server port.
- set time enable <value>** Enable or disable fetching time from the specified sNTP time server. Default=0= disabled. A value or 1 gets time only once on power up. Any value > 1 gets time continuously every <value> minutes.

## SYSTEM Parameters

- set sys autoconn <secs>** TCP mode: sets the auto connect timer. This command causes the module periodically connect to the host. The timer <secs> determines how often to connect to the stored remote host. If set to 1, the module will only make one attempt to auto connect upon power up. If set to 2 or greater auto connect will re-open the connection after the connection is closed. Default=0 disables.
- set sys autosleep <num>** Sets the auto-sleep timer. 0 disables. If the protocol is set to UDP ONLY, this timer is used as a quick sleep function. Device will sleep <num> ms after transmission of the first UDP packet.
- set sys printlvl <value>** sets numerous print functions. 0 = quiet 1 = connect information Default is 1.
- set sys sleep <secs>** sets the sleep timer. 0 disables.
- set sys wake <secs>** sets the auto wake timer. 0 disables.

## UART Parameters

- set uart baud <rate>** set the UART baud rate. Valid settings are {2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600}.

## Command Summary

All configuration information is stored in flash memory. The "set" commands modify only the RAM copy of the configuration. Using the "save" command stores the configuration into flash memory. The WiFLY only reads the configuration from flash when powering up or after a reboot.

The following is listing of the mode frequently use WiFly Serial adapter commands. For a complete listing of command refer to the WiFly GSX module user manual.

## Set commands

### COMM Parameters

- set comm close <string>** sets the ASCII string that is sent to the local UART when the TCP port is closed. If no string is desired, use 0 as the <string> parameter. Max string length is 32 characters. Default is \*CLOS\*
- set comm open <string>** sets the string that is sent to the local UART when the TCP port is opened. If no string is desired, use 0 as the <string> parameter. Max string length is 32 characters. Default is \*OPEN\*
- set comm remote <string>** sets the string that is sent to the remote TCP client when the TCP port is opened. If no string is desired, use 0 as the <string> parameter. Max string length is 32 characters. Default is \*HELLO\*
- set comm idle <secs>** sets the Idle Timer Value. This is the number of seconds with no transmit or receive data before the connection is closed automatically. Default is 0, never disconnect on idle.
- set comm match <value>** sets matching character initiate forwarding data across the TCP/IP connection. The value is entered as the decimal value of the of the ASCII character. Default is 0, disabled.
- set comm size <value>** sets the Flush Size value. This is the number of bytes to receive on the UART

before forwarding. 0 disables forwarding based on byte count. Default is 64 bytes (at 9600). Maximum value = 1420 bytes.

*NOTE: This value is set automatically when the baudrate is set, in an attempt to optimize the link. It is assumed that higher baudrates suggest larger buffer sizes and hence the size will increase at higher baudrate settings.*

**set comm time <num>**

sets the Flush Timer. This is the number of 1 millisecond intervals after the last UART byte is received before the data is sent over Wifi. 1 is the minimum value. Default is 10 (10 milliseconds). Setting this value to 0 will disable forwarding based on time delay.

**IP Parameters**

**set ip address <addr>**

sets the IP address of the WiFly GSX module. If DHCP is turned on, the IP address is assigned and overwritten during association with the access point. IP addresses are "." delimited.

Example: "set ip a 10.20.20.1"

**set ip dhcp <value>**

enable/disable DHCP mode. If enabled, the IP address, gateway, netmask, and DNS server are requested and set upon association with access point. Any current IP values are overwritten.

DHCP Cache mode can reduce the time it takes the module to wake from deep sleep thus saving power. In cache mode, the lease time is checked and if not expired the module uses the previous IP settings. If the lease has expired the module will attempt to associated and use DHCP to get the IP settings.

Mode	Protocol
0	DHCP OFF, use stored static IP address

1	DHCP ON, get IP address and gateway from AP
2	Auto-IP, generally used with Adhoc networks
3	DHCP Cache mode, Uses previous IP address if lease is not expired (lease survives reboot)
4	Reserved for future use

**set ip gateway <addr>**

sets the gateway IP address, If DHCP is turned on, the gateway IP address is assign and overwritten during association with the access point.

**set ip host <addr>**

sets the remote host IP address. This command is used for making connections from the WiFly module to a TCP/IP server at the IP address <addr>.

**set ip localport <num>**

sets the local port number, used to "listen"

**set ip netmask <value>**

sets the network mask. If DHCP is turned on, the net mask is assign and overwritten during association with the access point.

**set ip protocol <value>**

sets the IP protocol. Value is a bit mapped setting. To connect to the WiFly GSX module over TCP/IP such as Telnet the device must have the use the TCP Server protocol / bit 2 set. To accept both TCP and UDP use value = 3 (bit 1 and bit 2 set)

Bit Position	Protocol
1	UDP
2	TCP Server & Client(Default)
3	Secure (only receive packets with IP address matches the store host IP)
4	TCP Client only
5	HTTP (future use)

**set ip remote <value>**

sets the remote host port number (for outgoing connections )