

## WiFly GSX Super Module "SuRF Board"

### Features

- UART interface with RS232 and TTL signaling
- Through hole board simplifies system integration
- Accepts 3-12VDC
- Status LEDs to show network status and data transfer
- Ultra-low power - 4uA sleep, 50mA Rx, 210mA Tx (max)
- High throughput, 1Mbps sustained data rate with TCP/IP and WPA2
- Through hole design with mounting posts
- Jumpers for setting adhoc mode
- On board ceramic chip antenna and U.FL connector for external antenna
- 10 general purpose digital I/O
- 8 analog sensor interfaces
- Real-time clock for wakeup and time stamping
- On board ECOS -OS, TCP/IP stacks
- Wi-Fi Alliance certified for WPA2-PSK
- FCC / CE / ICS certified and RoHS compliant.

### Applications

- Wireless serial connections
- Remote sensors
- Telemetry
- Security
- Industrial sensors and controls
- Home Automation



### Description

The RN-134 "SuRF" board is field ready, WiFi certified 802.11 b/g solution. The SuRF board has the flexibility to connect directly to a standard RS232 interface or through the TTL UART interface to embedded systems. The status LEDs and jumpers enable rapid prototyping and integrating into existing systems.

The RN-134 is built upon Roving Networks RN-131 WiFly-GSX module. The WiFly GSX module incorporates a 2.4GHz radio, processor, Full TCP/IP stack, real-time clock, FTP, DHCP, DNS and web server. The RN-131G is the smallest, lowest power 802.11 b/g module available. The module supports adhoc and infrastructure networking.

In the simplest configuration the hardware only requires four connections (PWR, TX, RX, GND). In cases where power is available on the RS232 DB9 connector of your application, the RN134 can be directly wired to create an instant serial to Wifi network link.

Additionally, the analog sensor interface provides direct connections to send temperature, acceleration and other analog data without requiring additional hardware. The WiFly GSX module is programmed and controlled with a simple ASCII command language. Once the WiFly GSX is setup it can scan to find an access point, associate, authenticate and connect over any Wifi network.

## Overview

- Host Data Rate up to 1 Mbps for UART interface, 230400 for RS232 interface.
- Intelligent, built-in power management with programmable wakeup
- Powered from regulated 3.3-3.7V source or 2.0-3.0V batteries
- Real time clock for time stamping, auto-sleep and auto-wakeup modes
- Configuration over WiFi or UART using simple ASCII commands
- Over the air firmware upgrade via FTP
- Secure WiFi authentication: WEP-64, WEP-128, WPA, WPA2
- Built in networking applications DHCP, DNS, ARP, ICMP UDP, Telnet, FTP
- 802.11 power save and roaming functions

## Environmental Conditions

| Parameter                     | Value          |
|-------------------------------|----------------|
| Temperature Range (Operating) | -30 °C ~ 85 °C |
| Temperature Range (Storage)   | -30 °C ~ 85 °C |
| Relative Humidity (Operating) | ≤90%           |
| Relative Humidity (Storage)   | ≤90%           |

## Electrical Characteristics

| Supply Voltage           | Min | Typ | Max | Unit |
|--------------------------|-----|-----|-----|------|
| Supply Voltage VDD       | 3.0 | 3.3 | 12  | V    |
| UART interface           | 3.0 | 3.3 | 3.3 | V    |
| <b>Power consumption</b> |     |     |     |      |
| Sleep                    |     | 4   |     | µA   |
| Standby (doze)           | -   | 15  | -   | mA   |
| Connected (idle, RX)     |     | 40  |     | mA   |
| Connected (TX)           |     | 140 | 212 | mA   |

## Analog Sensor Inputs

| Parameter                                    | Value                             |
|--|-----------------------------------|
| Sense 0,1,2,3 wakeup detect threshold        | 500mV                             |
| AD sense 0-7 measurement range               | 0-400mV                           |
| Precision                                    | 14 bits = 12µV                    |
| Accuracy                                     | 5% un-calibrated. .01% calibrated |
| Minimum conversion time                      | 35µS (5kHz over wifi )            |
| Sensor Power (pin 33) output resistance 3.3V | 10 ohms, max current = 50mA       |

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**Radio Characteristics**

| Parameter                          | Specifications  |
|------------------------------------|---|
| Frequency                          | 2402 ~ 2480MHz  |
| Modulation                         | 802.11b compatibility : DSSS(CCK-11, CCK-5.5, DQPSK-2, DBPSK-1)<br>802.11g : OFDM (default) |
| Channel intervals                  | 5MHz  |
| Channels                           | 1 - 14  |
| Transmission rate (over the air)   | 1 – 11Mbps for 802.11b / 6 – 54Mbps for 802.11g   |
| Receive sensitivity                | -85dBm typ.   |
| Output level (Class1)              | +18dBm  |
| Maximum RF input to U.FL connector | 10 dBm  |

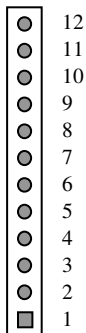
## Board Description

### UART Interface TTL signals

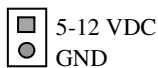
RX - input to SuRF board  
TX - output from SuRF board

(Note: the labels on the board for RX and TX are incorrect)

| PIN | Description |
|-----|-------------|
| 1   | 3.3 VDC     |
| 2   | GND         |
| 3   | RXDB        |
| 4   | TXDB        |
| 5   | RSTB        |
| 6   | CTSB        |
| 7   | PIO4        |
| 8   | PIO5        |
| 9   | PIO6        |
| 10  | PIO7        |
| 11  | PIO8        |
| 12  | Reset       |



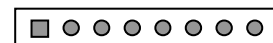
### Power



### Evaluation Board Connector



1 2 3 4 5 6 7 8

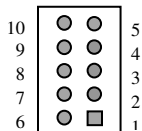


### Sensors

**WARNING:** Sensors must not be driven with more than 1.2 VDC or permanent damage will occur

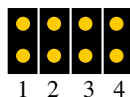
| PIN | Description                  |
|-----|------------------------------|
| 1   | Sensor PWR                   |
| 2   | Resistor network to Sensor-4 |
| 3   | Resistor network to Sensor-5 |
| 4   | Sensor-7 (1.2 VDC)           |
| 5   | Sensor-4 (1.2 VDC)           |
| 6   | Sensor-5 (1.2 VDC)           |
| 7   | Sensor-6 (1.2 VDC)           |
| 8   | GND                          |

### RS232 Interface



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

| PIN | Description |
|-----|-------------|
| 1   | No connect  |
| 2   | RX          |
| 3   | TX          |
| 4   | No connect  |
| 5   | GND         |
| 6   | No connect  |
| 7   | RTS         |
| 8   | CTS         |
| 9   | 5 - 12 VDC  |
| 10  | No connect  |



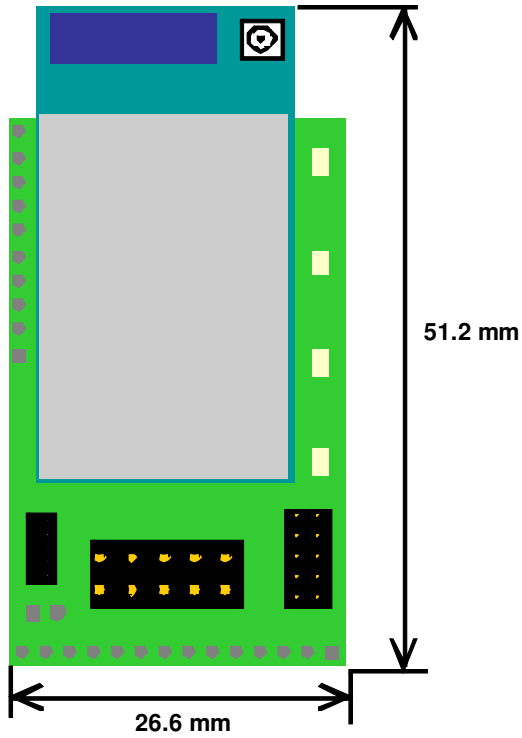
### Jumper Block 1 - 4

- 1) Adhoc mode & Factory Reset
- 2) Config 1
- 3) Config 2
- 4) Config 3

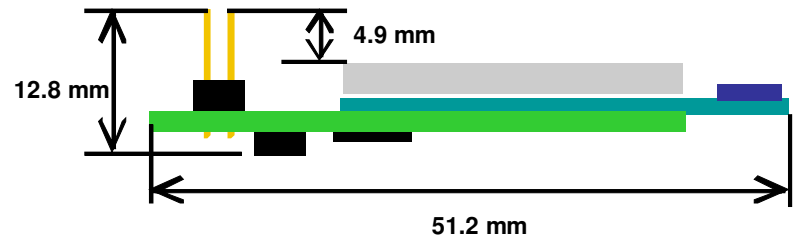
### LED Indicators

| Condition  | Blue LED | Red LED                 | Yellow LED          | Green LED          |
|------------|----------|-------------------------|---------------------|--------------------|
| ON solid   | Power On |                         |                     | Connected over TCP |
| Fast blink |          | Not Associated          | Rx/Tx data transfer | No IP address      |
| Slow blink |          | Associated, No Internet |                     | IP address OK      |
| OFF        | No Power | Associated, Internet OK |                     |                    |

**Physical Dimensions**



Top view



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6.

Having this jumper on at power up also arms the restore factory reset function. After power up, if jumper 1 is toggled on and off five times while the module the configuration will be RESTORED to the initial settings. This is very useful in cases where the module is mis-configured and no is long responding to commands.

## Compliance Information

|               |  |
|---------------|--|
| <b>FCC</b>    | <b>ID U3O-G2M5477 Part 15.247</b>                                  |
| <b>IC</b>     | <b>(canada) RSS-210</b>  |
| <b>CE</b>     | <b>EU ID # 0681</b>  |
| <b>REG</b>    | <b>U9M20901-1000-C</b>   |
| <b>RADIO</b>  | <b>EN 300328 V1.7.1 (10/2006)</b>                                  |
| <b>EMC</b>    | <b>EN 301489-1 V1.8.1 (04/2008), EN 301489-17 V1.3.2 (04/2008)</b> |
| <b>SAFETY</b> | <b>EN 60950-1:2001+A11:2004</b>                                    |
| <b>RoHs</b>   | <b>Compliant</b>   |

## Ordering Information

| <b>Part Number</b>  | <b>Description</b>   |
|---|--|
| RN-134  | With chip antenna and U.FL jack. Standard firmware version                     |
| RN-131G   | WiFly-GSX 802.11 b/g surface mount module                                      |
| RN-131G-EVAL  | Development Kit (Includes the RN-134 module)                                   |
| RN-UFL-SMA6   | 6 inch cable with U.FL connector on one end and SMA on the other               |
| RN-SMA4-RP  | 4" external antenna with reverse polarity SMA connector. Used with RN-UFL-SMA6 |
| For other configurations, contact Roving Networks directly. |  |

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