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.

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 enterprise 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 Wifl network.

Applications

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

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-128, WPA-PSK (TKIP), WPA2-PSK, EAP-TLS for mixed mode Enterprise
- 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 ^{o}C ~ 85 ^{o}C
Temperature Range (Storage)	-30 ^{o}C ~ 85 ^{o}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
Power consumption				
Sleep		4		uA
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 = 12uV
Accuracy	5% un-calibrated, .01% calibrated
Minimum conversion time	35uS (5kHz over wifi)
Sensor Power (pin 33) output resistance 3.3V	10 ohms, max current = 50mA

---

809 University Avenue • Los Gatos, CA 95032 • Tel (408) 395-6539 • info@RovingNetworks.com

~ page 2 ~

Radio Characteristics

| Parameter	Specifications
Frequency	2402 ~ 2480MHz
Modulation	802.11b compatibility : DSSS(CCK-11, CCK-5.5, DQPSK-2, DBPSK-1) 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 lables 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
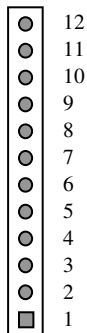
Evaluation Board Connector

Power
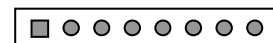
- 5-12 VDC
- GND

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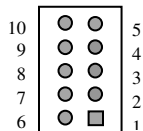
RX - input to SuRF board
TX - output from SuRF board

| 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
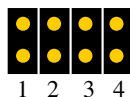
Jumper Block 1 - 4

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

51.2 mm

**26.6 mm**

Top view

12.8 mm

4.9 mm

51.2 mm
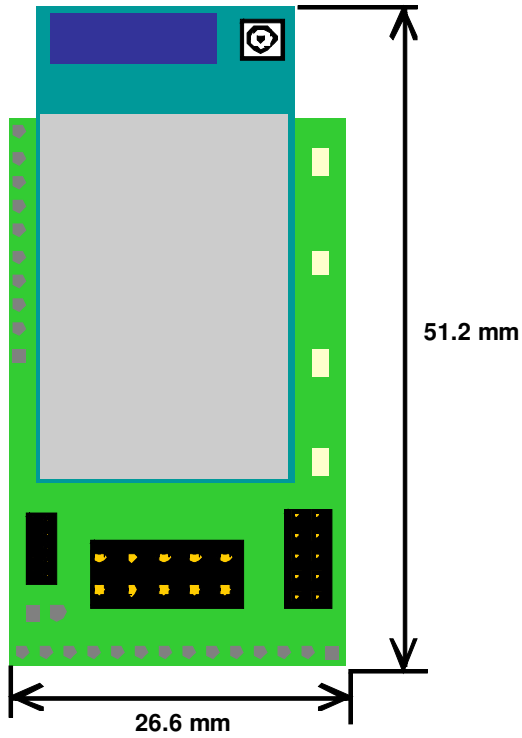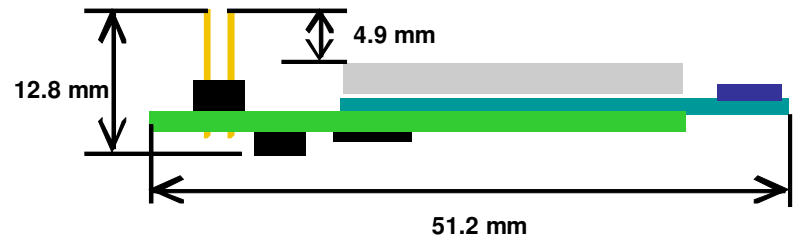
Design Concerns

1. ***Minimizing Radio interference.*** When integrating the RN-134 into your system, make sure the area around the chip antenna that overhangs the PCB is away from any metal enclosure. If this is not possible use the on board U.FL jack with a U.FL to SMA cable to connect an external antenna.   To switch between the chip and external antenna use the **set wlan antenna <num>** command where 0 = chip and 1 = U.FL.

2. ***U.FL connector.*** Use Hirose U.FL connector **U.FL-R-SMT** to for connecting external antennas. See Roving Networks U.FL to SMA cable. Part number: RN-UFL-SMA6

U.FL-R-SMT-1
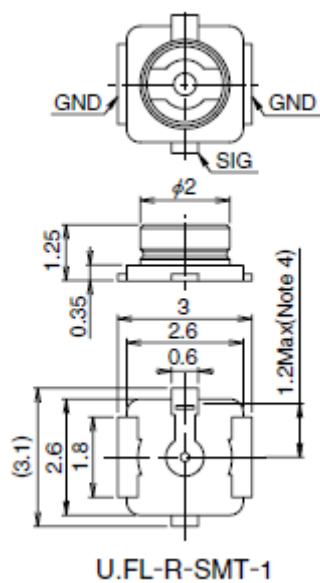
3. ***Powering the module.*** The RN-134 can be powered from the RS232 header, the UART interface or the power connector. You should only provide power on one of the three interfaces.

   If powered from the RS232 header, apply 3 to 12 VDC on pin 9 and ground to pin 5 of the RS232 header.

   If powered from the UART interface, apply 3.3 VDC on pin 1 and ground on pin 2 of the UART interface.

   If powered from the power connector, apply 3 to 12 VDC

4. ***Sensor Interfaces.*** Inputs must not exceed 1.2V. Sensitivity saturates at 400 mV.   It is recommended that you use the Sensor power output to drive any analog devices that are attached to the sensor pins.

   Note the exception to this is Sensor pins 2 and 3. These have a resistor network in front of sensors 4 and 5 respectfully so they can be drive with up to 5 VDC.

5. ***Adhoc and Restoring Factory Settings.*** Jumper 1 on the jumper header is connected to PIO9. When this jumper is in place the module will power up in adhoc mode. . If the jump is then toggled 5 times, the initial factory default configuration will be RESTORED. This is useful for cases where the module is mis-configured and is no long responding.

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

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

Ordering Information

Part Number	Description
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.	

  Visit http://www.rovingnetworks.com for current pricing and a list of distributors carrying our products.

Roving Networks reserves the right to make corrections, modifications, and other changes to its products, documentation and services at any time. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

Roving Networks assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using Roving Networks components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

809 University Avenue • Los Gatos, CA 95032 • Tel (408) 395-6539 • info@RovingNetworks.com

~ page 7 ~

Roving Networks products are not authorized for use in safety-critical applications (such as life support) where a failure of the Roving Networks product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use.

All other trademarks are property of their respective owners.