

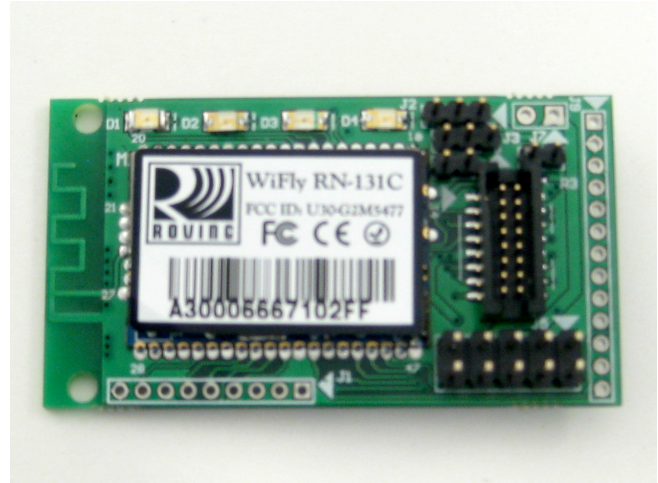
WiFly GSX Super Module

Features

- Development board containing the RN-171 module, status LEDs, power regulator
- Supports chip antenna (RN-174-C), PCB Trace antenna (RN-174-P), wire antenna (RN-174-W) and U.FL connector for external antenna (RN-174-U)
- Ultra-low power - 4uA sleep, 30mA Rx, 180 mA Tx at 10dBm
- Configurable transmit power: 0dBm-10dBm
- Hardware interface: RS-232, TTL UART
- Up to 1Mbps data rate over UART
- Through hole board simplifies system integration
- Accepts 3.3-16 VDC
- Jumpers for setting adhoc mode and enabling battery boost circuit
- 10 general purpose digital I/O
- 8 analog sensor interfaces. Configurable sensor power outputs 0-3.3V DC
- Real-time clock for wakeup and time stamping
- On board ECOS -OS, complete TCP/IP networking stack
- 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-174 development board is field ready, WiFi Alliance certified 802.11 b/g prototyping platform. The board has the flexibility to connect directly to a standard RS232 interface or through the TTL UART interface to embedded processors. The RN-174 contains a battery boost circuit which makes it possible to power the board using two AA batteries. This makes the RN-174 perfect for battery powered applications such as sensors, asset tracking, etc. The status LEDs and jumpers enable rapid prototyping and integrating into existing systems.

The RN-174 is based on the Roving Networks RN-171 WiFly-GSX module. The WiFly GSX module incorporates a 2.4GHz radio, processor, full TCP/IP stack, real-time clock, FTP, DHCP, DNS and HTML client protocols. The RN-171G 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).

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

Overview

- Host Data Rate up to 921 Kbps TX, 500 Kbps RX for UART
- Intelligent, built-in power management with programmable wakeup
- Powered from regulated 3.3-3.7V source or 2.0-3.0V batteries when using battery boost circuit
- 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, HTML client
- 802.11 b/g power save and roaming functions
- Configurable transmit power: 0dbm to 10dBm

Environmental Conditions

Parameter	Value
Temperature Range (Operating)	-45 °C ~ 85 °C
Temperature Range (Storage)	-45 °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	16	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)		180 at 10dBm		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

Radio Characteristics

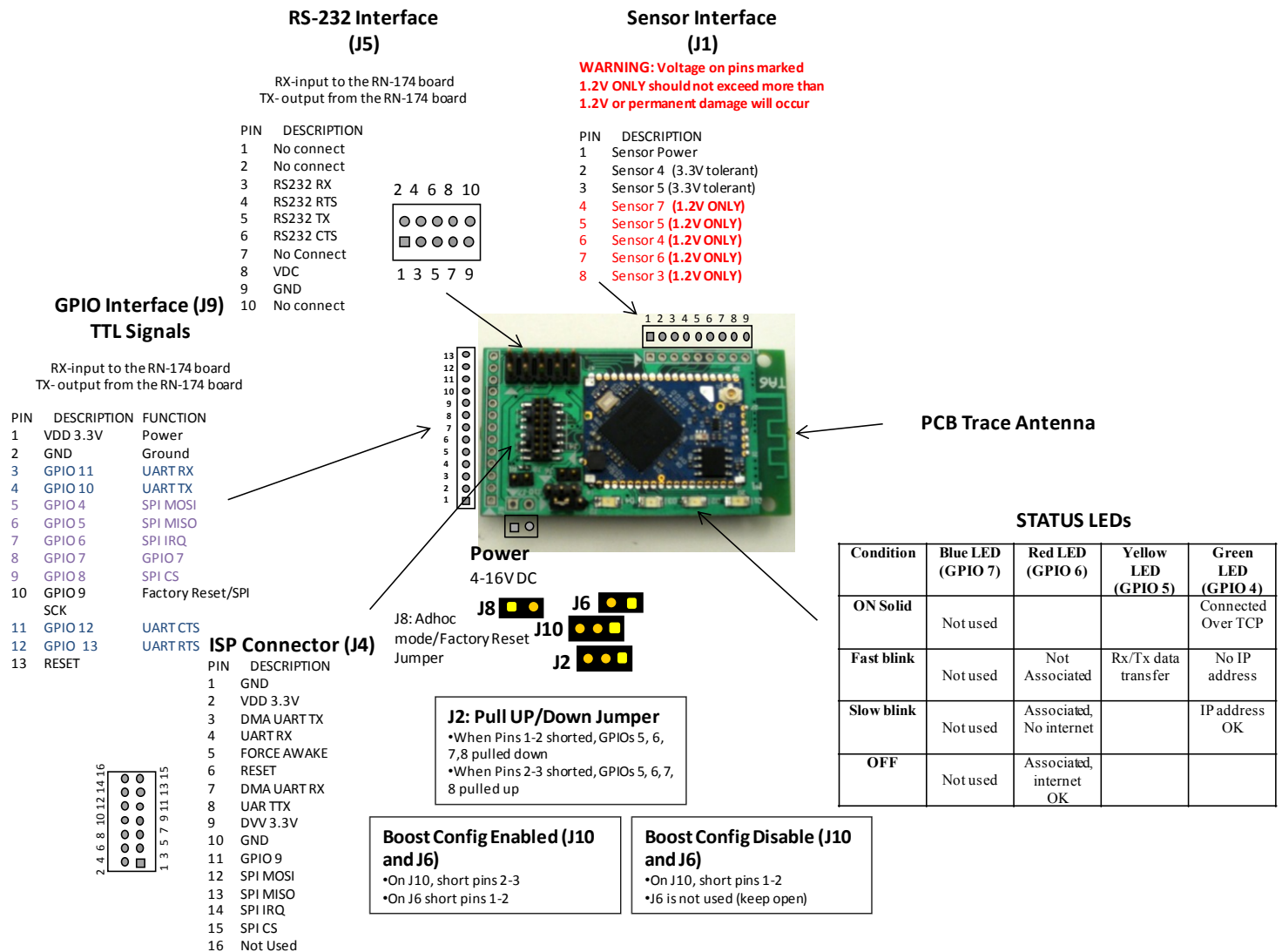
Parameter	Specifications
Frequency	2402 ~ 2480MHz
Modulation	802.11b compatibility : DSSS(CCK-11, CCK-5.5, DQPSK-2, DBPSK-1) 802.11g : OFDM (default)
Channel intervals	5MHz
Channels	1 - 14
Transmission rate (over the air)	1 – 11Mbps for 802.11b / 6 – 54Mbps for 802.11g
Receive sensitivity	-83dBm typ.
Output level (Class1)	+10dBm

Transmit Power

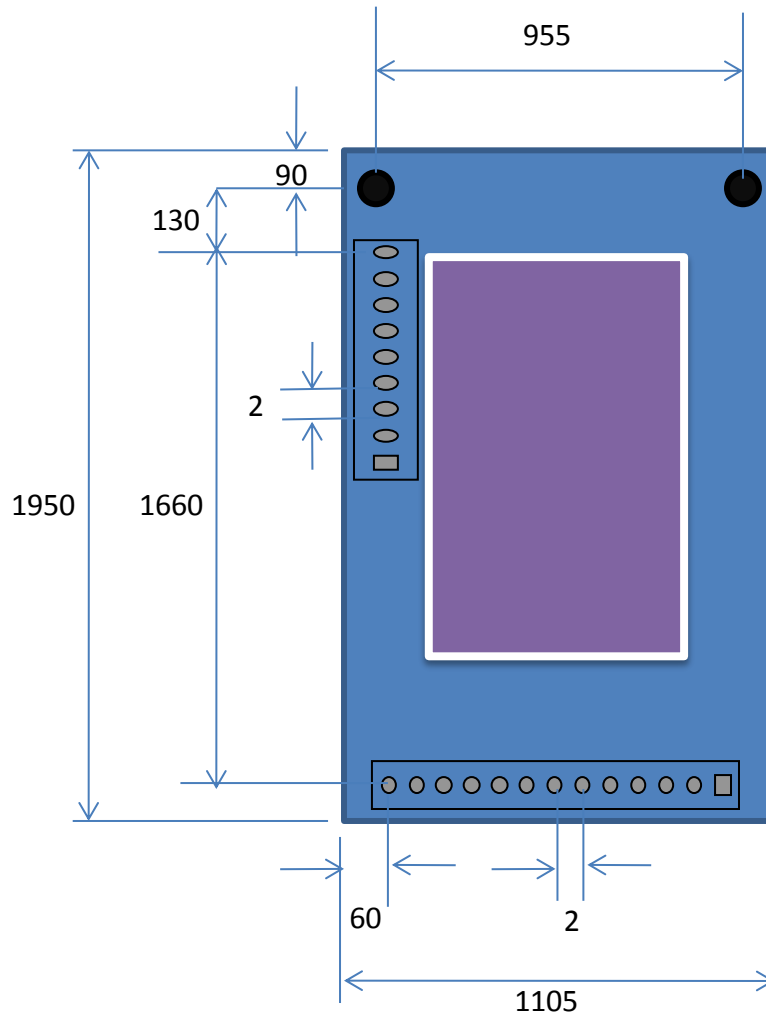
Output Power	802.11 b (2Mbps) Current in mA*	802.11 g (24Mbps) Current in mA*
0	120	135
2	130	150
4	170	190
6	175	200
8	180	210
10	185	225
12	190	240

* Measured at 3.3VDC VCC. The power consumption is the average power, active during actual power consumption

Board Description



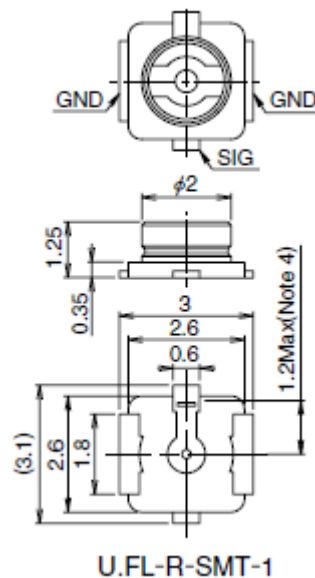
Physical Dimensions



All dimensions are in mils

Design Concerns

1. **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



2. **Powering the module.** The RN-174 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 4 to 16 VDC

3. **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.

4. **Adhoc and Restoring Factory Settings.** Jumper J8 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.

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.

Ordering Information

Part Number	Description
RN-174-U	RN-174 board with U.FL connector, standard firmware
RN-174-W	RN-174 board with wire antenna*, standard firmware
RN-174-P	RN-174 board with PCB trace antenna*, standard firmware
RN-174-C	RN-174 board with chip antenna*, standard firmware
RN-174-KIT	Development Kit (Includes the RN-174 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.	

* For these non-standard configurations, please contact Roving Networks directly at info@rovingnetworks.com

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