VN210 RF Modem User's Manual

Version 1.0

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Revision History

Date	Revision	Description	Author
05/18/2009	1.0	Document Creation	Szabolcs Zigovszki

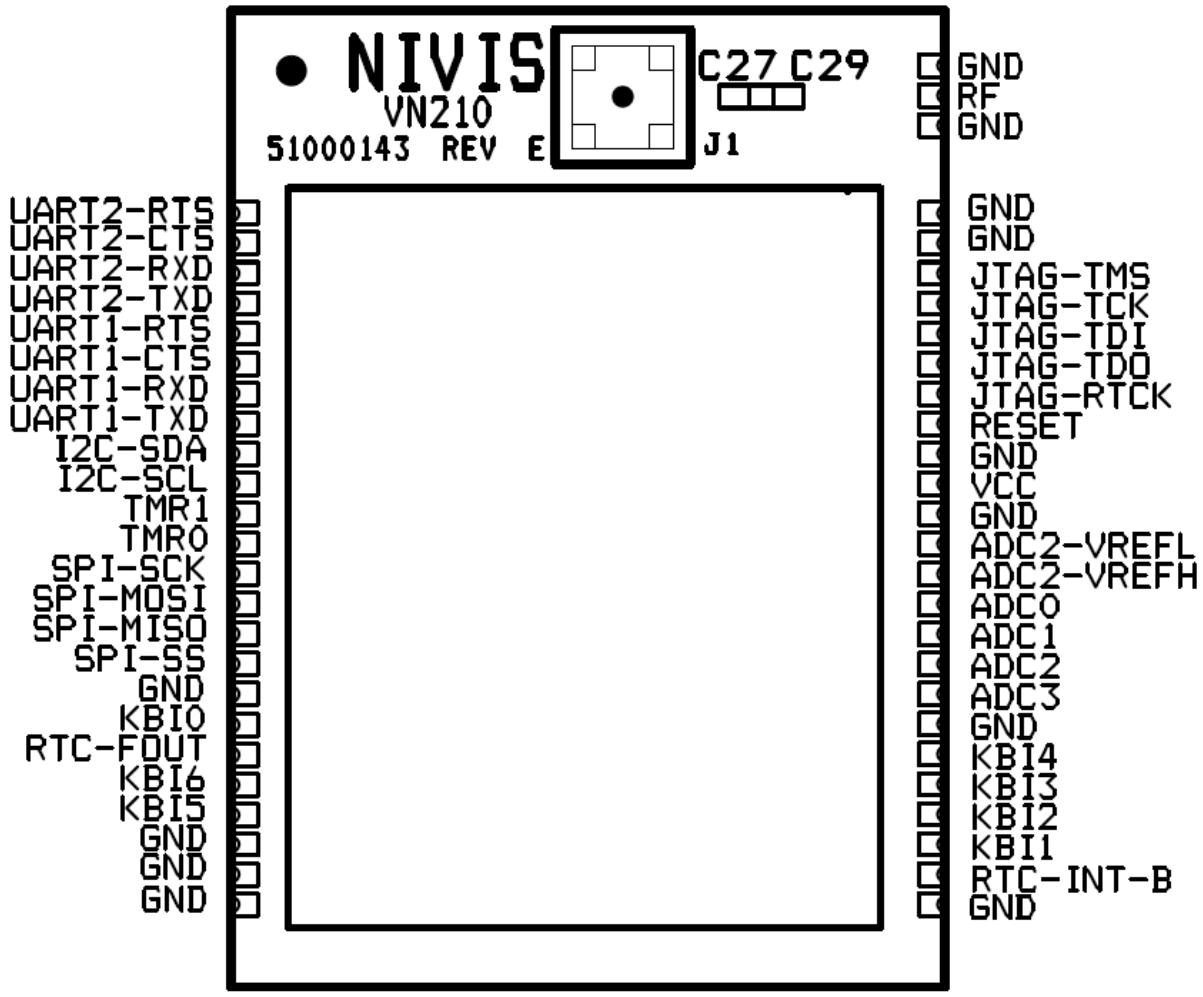
Table of Contents

1. Purpose of Document

This document was created in order to provide to the user clear guidelines regarding the usage of the VN210 RF modem.

2. Overview of the Radio Modem Hardware

The VN210 radio modem is an 802.15.4 wireless module that allows communication using a standard asynchronous serial data stream. The pin-out of the VN210 radio modem is presented in the figure below.



No.	Name	Description	Type	Dir	Comments
1	UART2-RTS	UART2 Request to Send	DIG	I	Can be configured as GPIO
2	UART2-CTS	UART2 Clear to Send	DIG	O	Can be configured as GPIO
3	UART2-RXD	UART2 Receive Data	DIG	I	Can be configured as GPIO
4	UART2-TXD	UART2 Transmit Data	DIG	O	Can be configured as GPIO
5	UART1-RTS	UART1 Request to Send	DIG	I	Can be configured as GPIO
6	UART1-CTS	UART1 Clear to Send	DIG	O	Can be configured as GPIO
7	UART1-RXD	UART1 Receive Data	DIG	I	Can be configured as GPIO
8	UART1-TXD	UART1 Transmit Data	DIG	O	Can be configured as GPIO
9	I2C-SDA	I2C bus DATA	DIG [1]	I/O	Can be configured as GPIO
10	I2C-SCL	I2C bus CLOCK	DIG [1]	I/O	Can be configured as GPIO
11	TMR1	Timer 1 I/O	DIG	I/O	Can be configured as GPIO
12	TMR0	Timer 0 I/O	DIG	I/O	Can be configured as GPIO
13	SPI-SCK	SPI Clock	DIG	O [2]	Can be configured as GPIO
14	SPI-MOSI	SPI Data Out	DIG	O [2]	Can be configured as GPIO
15	SPI-MISO	SPI Data In	DIG	I [2]	Can be configured as GPIO
16	SPI-SS	SPI Slave Select	DIG	O [2]	Can be configured as GPIO
17	GND	Ground	N/A	N/A	
18	KBI0	RTC clock out enable / Keyboard interface pin 0	DIG	O	
19	RTC-FOUT	32768Hz RTC clock out	DIG	O	
20	KBI6	Keyboard interface pin 6	DIG	I/O	Can be configured as GPIO
21	KBI5	Keyboard interface pin 5	DIG	I/O	Can be configured as GPIO
22	GND	Ground	N/A	N/A	
23	GND	Ground	N/A	N/A	
24	GND	Ground	N/A	N/A	
25	GND	Ground	N/A	N/A	
26	RTC-INT-B	RTC wake-up interrupt / Keyboard interface pin 7	DIG	O	
27	KBI1	Keyboard interface pin 1	DIG	I/O	Can be configured as GPIO
28	KBI2	Keyboard interface pin 2	DIG	I/O	Can be configured as GPIO
29	KBI3	Keyboard interface pin 3	DIG	I/O	Can be configured as GPIO
30	KBI4	Keyboard interface pin 4	DIG	I/O	Can be configured as GPIO
31	GND	Ground	N/A	N/A	
32	ADC3	ADC pin 3	Analog	I	Can be configured as GPIO
33	ADC2	ADC pin 2	Analog	I	Can be configured as GPIO
34	ADC1	ADC pin 1	Analog	I	Can be configured as GPIO

35	ADC0	ADC pin 0	Analog	I	Can be configured as GPIO
36	ADC2-VREFH	ADC2 reference, high pin	Analog	I	Can be configured as GPIO
37	ADC2-VREFL	ADC2 reference, low pin	Analog	I	Can be configured as GPIO
38	GND	Ground	N/A	N/A	
39	VCC	Supply voltage	N/A	N/A	
40	GND	Ground	N/A	N/A	
41	RESET	RESET pin	DIG	I	
42	JTAG-RTCK	JTAG Return Clock / ADC pin 7	DIG	O	Can be configured as GPIO Can be configured as Analog In
43	JTAG-TDO	JTAG Test Data Output	DIG	O	Can be configured as GPIO
44	JTAG-TDI	JTAG Test Data Input	DIG	I	Can be configured as GPIO
45	JTAG-TCK	JTAG Test Data Input	DIG	I	Can be configured as GPIO
46	JTAG-TMS	JTAG Test Mode Select	DIG	I	Can be configured as GPIO
47	GND	Ground	N/A	N/A	
48	GND	Ground	N/A	N/A	
49	GND	Ground	N/A	N/A	
50	RF	RF pin	Analog	I/O	
52	GND	Ground	N/A	N/A	

Notes:

1.) Open collector pin if configured as I2C port
2.) Signal Dir valid if module is configured as SPI Master

Power is supplied to the modem through pins 38, 39 and 40.

Pin 39 must be supplied with 2.7 to 3.3 Volts and powers the digital and RF functional entities of the modem. The modem has internal filtering circuitry to smooth out the supply voltage but it has no onboard regulators.
All of the remaining pins of the modem are I/O lines of the processor, except for pin 50, which is the RF I/O port.

The voltage on any of the I/O lines should never exceed VCC+0.3 V.

Pins 1 to 4 are attached to UART 2. Pins 5 to 8 are attached to UART1. If connecting to the serial port of a PC, a level-shifting transceiver must be employed in order to provide the appropriate voltage levels on the RX and TX lines.

3. Operation of the Nivis Radio Modem

Communication with the VN210 radio modem happens through serial port 1. The baud-rate is set to be 115200, 8N1.

3.1. Getting started

Open a terminal software on a serial port with the above settings and connect to the RF modem. Upon power up, the terminal will display a list of the available commands.

4. RF Exposure Limit Warning

To comply with FCC's RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

5. Compliance Statement (Part 15.19)

This Device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

6. OEM Responsibility to the FCC Rules and Regulations

The VN210 RF Module has been certified per FCC Part 15 rules for integration into products without further testing or certification. To fulfill the FCC certification requirements the OEM of the VN210 RF Module must ensure that the information provided on the VN210 RF Module label is placed on the outside of the final product. The VN210 RF Module is labeled with its own FCC ID Number. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:

“Contains Transmitter Module FCC ID: SQB-NIVISMOD0003”
or
“Contains FCC ID: SQB-NIVISMOD0003”

The OEM of the VN210 RF Module must only use the approved antenna, which has been certified with this module.

The OEM of the VN210 RF Module must test their final product configuration to comply with Unintentional Radiator Limits before declaring FCC compliance per Part 15 of the FCC rules.

7. Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.