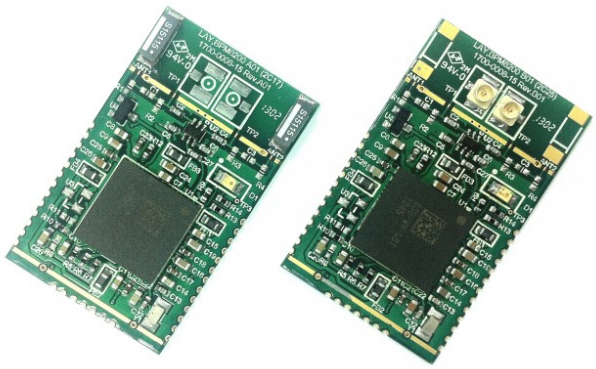
Radicom Research, Inc

Preliminary

Designers Guide for the

RW8200 Series



***RoHS** Compliant*

Serial Embedded WiFi Modules.

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Introduction

Thanks for purchasing Radicom's serial Embedded WiFi Module. Radicom is committed to providing quality service and technical support in order to expedite the product development process. The RW8200 Module requires only a serial port interface to add state of the art data WiFi wireless operation to any system. The RW8200 Serial to WiFi Module integrates a ARM9 processor, Wireless Internet Connectivity for Embedded Devices (WICED) and an embedded processor. Featuring a self-contained WiFi subsystem, a streamlined and simple connectivity API and complete software development environment, the RW8200 allows OEM integrators to incorporate WiFi wireless technology into a broad range that previously did not feature networking capabilities. It is designed to fully support **IEEE802.11b** Draft 2.0, **IEEE802.11g** and **IEEE802.11n** standards. The RW8200 is available in surface mount (SMD) or through-hole (Dip) hardware designs. If further information is required, please contact us and we will provide any additional help needed.

Features

- Compatible with any serial port embedded controllers
- IEEE 802.11b/g/n compatible WLAN
- IEEE 802.11i ~ WiFi security: WEP-128, WPA-PSK(TKIP), WPA2-PSK
- RTOS and TCP/IP support
- Configurable through AT commands
- Low power 3.3V operation
- Extended operating temperature (-40°C to +85°C)
- Small size 0.787" x 1.299" (20x33mm)
- ROHS compliant
- WiFi Client and AP mode
- No powerful host processor required
- 2 general IO pins
- 1 analog IO pins
- Firmware upgradable through serial port
- Supports power save mode
- Integrated CMOS power amplifier
- Cisco compatible extension certified (CCX, CCX 2.0 CCX 3.0 CCX 4.0)
- Integrated ARM Cortex-M3 processor and on chip memory for complete WLAN subsystem functionality
- Agency approval: pending FCC15, IC, CE

Approvals

- FCC Part 15: FCC OET 65 Supplement C (SAR), 47 CFR FCC Part 15 Subpart C 15.247, 47 CFR FCC Part 15 Subpart B 2009 (Class B)
- IC RSS-102, IC ES-003 issue 4, IC RSS-210 issue 8:2010
- RoHS Compliant
- *CE Marked*: EN 300328 V1.7.1: 2006, EN 62311:2008(MPE), EN 301489-1 V1.9.2:2001 EN 301489-17 V2.2.1:2009, EN 60601-1:2006/AC: 2010

Technical Specification

Absolute maximum Rating

Symbol	Description	Min	Max	Unit
VDD_3V3	Input supply voltage	0	4.0	V

Recommended Operating Rating

Parameter	Min.	Typ.	Max.	Unit
VDD_3V3	3.15	3.3	3.6	V
Operating Temperature	-40°		+85°	°C
Relative Humidity (non-condensing)			95	%

Power Consumption

Condition: Condition: 25deg.C, includes Both WiFi and Micro-Controller

Item	Condition	Min	Nom	Max	Unit
Tx mode(11b Max current)	11Mbps		345		mA
Tx mode(11g Max current)	54Mbps		250		mA
Tx mode(11n Max current)	MCS7		210		mA
Rx mode	11b (11Mbps)		115	150	mA
	11g (54Mbps)		115	150	mA
	11n (MCS7)		115	150	mA

RF SPECIFICATION

1. WIRELESS SPECIFICATIONS

The WiFi Network Controller module complies with the following features and standards;

Features	Description
WLAN Standards	IEEE 802 Part 11b/g/n (802.11b/g/n single stream n)
Antenna Port	Support Single Antenna for WiFi
Frequency Band	2.400 – 2.484 GHz

The RF performance of WiFi Network Controller is given as follows. The default voltage is 3.3V.

Features	Description
Frequency Band	2.4000 – 2.497 GHz (2.4 GHz ISM Band)
Number of selectable Sub channels	14 channels

Modulation	OFDM, DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK , 16QAM, 64QAM
Supported rates	1,2, 5.5,11,6,9,12,24,36,48,54 Mbps & HT20 MCS 0~7
Maximum receive input level	- 10dBm (with PER < 8%@11 Mbps) - 20dBm (with PER < 10%@54 Mbps) - 20dBm (with PER < 10%@MCS7)
Output Power	17dBm @ 802.11b 13dBm @ 802.11g 11dBm @ 802.11n
Carrier Frequency Accuracy	+/- 20ppm (crystal: 26MHz +/-10ppm in 25^0C)

2. WiFi RF Transmitter Specification

802.11b Transmit					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Transmit output power level	1M/2M/5.5M/11M		17		dBm
Transmit center frequency tolerance		-20		20	ppm
Transmit spectrum mask	Fc-22MHz<F<Fc-11MHz & Fc+11MHz<F<Fc+22MHz(1/2/5.5/11Mbps; channel 1~13)			-30*	dBr
	F<Fc-22MHz & F>Fc+22MHz(1/2/5.5/11Mbps; channel 1~13)			-50*	dBr
Transmit power -on	10% ~ 90 %		0.3	2*	us
Transmit power -down	90% ~ 10 %		1.5	2*	us
Transmit modulation accuracy	1/2/5.5/11 Mbps		-17	-10	dB

*" indicates IEEE802.11 specification

802.11g Transmit					
Item	Condition	Min.	Typ.	Max.	Unit
Transmit output power level	6M/9M/12M/18M/24M/36M/48M/54M		13		dBm dBm dBm

Transmit center frequency tolerance		-20	0	20	ppm
Transmit modulation accuracy	6Mbps			-5*	dB
	9Mbps			-8*	dB
	12Mbps			-10*	dB
	18Mbps			-13*	dB
	24Mbps			-16*	dB
	36Mbps			-19*	dB
	48Mbps			-22*	dB
	54Mbps			-25*	dB
Transmit spectrum mask	@ 11MHz			-20*	dBr
	@ 20MHz			-28*	dBr
	@ 30MHz			-40*	dBr

802.11n Transmit					
Item	Condition	Min.	Typ.	Max.	Unit
Transmit output power level	HT20 MCS 0~7		11		dBm dBm dBm
Transmit center frequency tolerance		-20	0	20	ppm
Transmit modulation accuracy	HT20, MCS0~7			-28*	dB dB
Transmit Spectrum mask	@ 11MHz			-20*	dBr
	@ 20MHz			-28*	dBr
	@ 30MHz			-40*	dBr

*” indicates IEEE802.11 specification

3 WIFi RF Receiver Specification

802.11 b Receiver					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Receiver minimum input level sensitivity (PER< 8 %)	1Mbps			-80*	dBm
	2Mbps			-80*	dBm
	5.5Mbps			-76*	dBm
	11Mbps			-76*	dBm
Receiver maximum input level sensitivity (PER< 8 %)	1/2/5.5/11 Mbps			-10*	dBm

“*” indicates IEEE802.11 specification

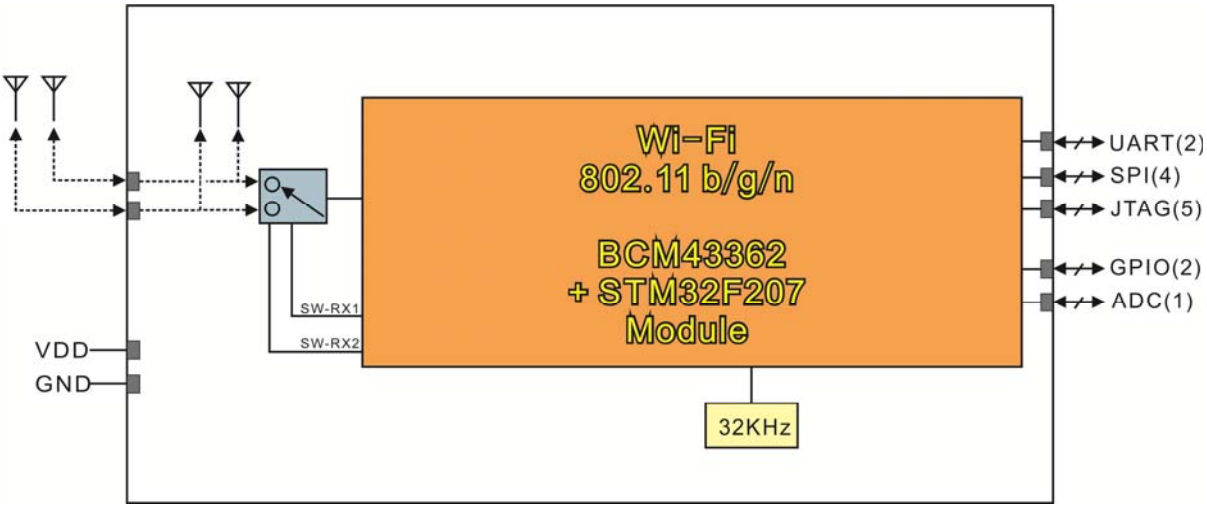
802.11g Receiver					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Receiver minimum input level sensitivity (PER<10 %)	6Mbps			-82*	dBm
	9Mbps			-81*	dBm
	12Mbps			-79*	dBm
	18Mbps			-77*	dBm
	24Mbps			-74*	dBm
	36Mbps			-70*	dBm
	48Mbps			-66*	dBm
	54Mbps			-65*	dBm
Receiver maximum input level (PER<10%)	6/9/12/18/24/36/48/54			-20*	dBm

“*” indicates IEEE802.11 specification

802.11n Receiver					
Item	**Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Receiver minimum input level sensitivity (PER<10 %)	HT20, MCS0			-82*	dBm
	HT20, MCS1			-79*	dBm
	HT20, MCS2			-77*	dBm
	HT20, MCS3			-74*	dBm
	HT20, MCS4			-70*	dBm
	HT20, MCS5			-66*	dBm
	HT20, MCS6			-65*	dBm
	HT20, MCS7			-64*	dBm
Receiver maximum input level (PER<10%)	MSC0~MSC7			-20*	dBm

“*” indicates IEEE802.11 specification

Block Diagram



RW8200 Series Block diagram
Operation Freq.: 2412~2484MHz

Model and Ordering Information

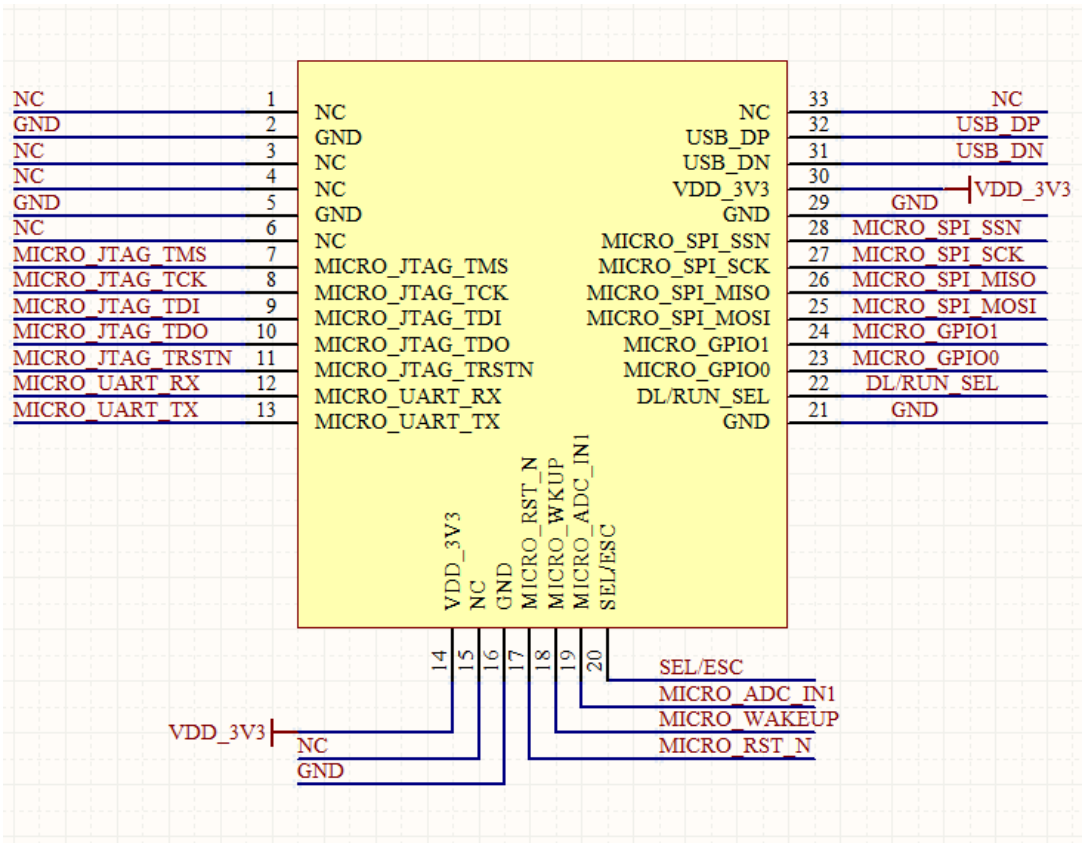
This versatile serial RW8200 family of products offers various configuration options to meet the specific system requirements a designer may need to add state of the art RW8200 operation. The RW8200 is available in surface mount (SMD) or through-hole (Dip) hardware designs. The RW8200 module is the surface mount model. The RW8200 can also be mounted on a conversion board to create the RW8200HM model for serial through-hole designs. Both Models are available with either On Board Chip Antennae or External antennae. The Onboard Antennae models are RW8200a and RW8200HMa. The External Antennae models are RW8200c and RW8200HMc

	Description	Comments
RW8200a/RW8200Ua/ BPM8200a 	**WiFi Surface Mount Serial Module with dual on board chip antenna**	**On board chip antenna**
RW8200c /RW8200Uc BPM8200c 	**WiFi Surface Mount Serial Module with two U.FL Connectors for attaching antenna cables and antenna**	**Can use either one or two cables and external antenna**
RW8200HMa 	**WiFi Serial Dip (Through Hole) Module with dual on board chip antenna**	**On board chip antenna**
RW8200HMc 	**WiFi Serial Dip (Through Hole) Module with two U.FL Connectors for attaching antenna cables and antenna**	**Can use either one or two cables and external antenna**

Model	Description	Comments
RW8200EKa (c) 	**Complete RW8200 development kits including RW8200HM module installed in RW8200MB Carrier Board. All kits include 6ft USB cable, DB9 Serial Port Cable and CD with Designers Guide. Two Antennae and Antennae Cables are also provided for external antenna models.**	**RW8200EKa Kit for Model(s) RW8200a or RW8200HMa** **RW8200EK1001c Kit for Model(s) RWM8200c or RW8200HMc**
AC6i-RP-SMA 	**6" U.FL. to RP-SMA female connector antenna cable**	***Antenna Cable for models RW8200c & RW8200HMc**
ATN-2d-RP-SMA 	**Replacement antenna, 2.4GHz, 2dBi, RP-SMA, Omni-directional.**	***Antenna for models RW8200c & RW8200HMc**

***These models can use either one or two cables and antennas. For ultimate performance, we recommend using two antennas to meet MIMO requirement with better adaptability for receiving. If only one antenna is used, it can be configured through the AT command.**

RW8200 Series Module Pin Definitions



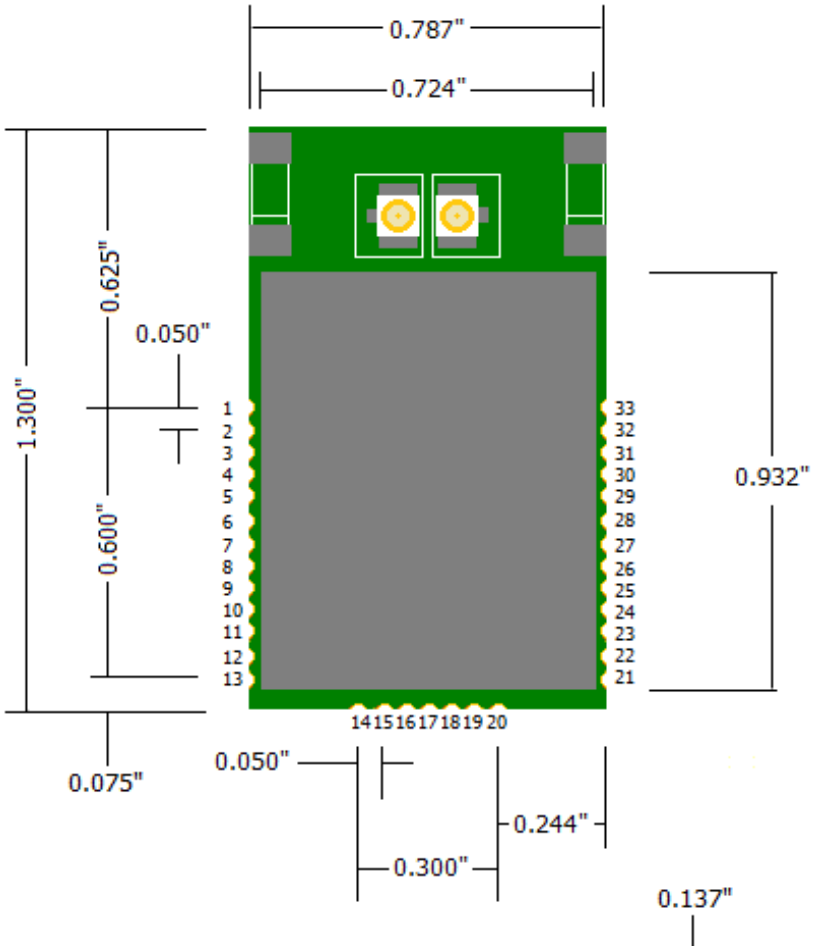
RW8200 Series Module Pin Descriptions

Pin #	Pin Name	Type	Description	I/O Voltage Range
1	NC	-	-	-
2	GND	-	-	-
3	NC	-	-	-
4	NC	-	-	-
5	GND	-	-	-
6	NC	-	-	-
7	MICRO_JTAG_TMS	I	MCU_JTAG_TMS	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
8	MICRO_JTAG_TCK	I	MCU_JTAG_TCK	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
9	MICRO_JTAG_TDI	I	MCU_JTAG_TDI	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
10	MICRO_JTAG_TDO	O	MCU_JTAG_TDO	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
11	MICRO_JTAG_TRSTN	I	MCU_JTAG_TRSTN	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
12	MICRO_UART_RX	I	MCU_UART _RX	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
13	MICRO_UART_TX	O	MCU_UART _TX	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
14	VDD_3V3	PWR	MCU input supply voltage	3.15 - 3.6V
15	NC	-	-	-
16	GND	-	Ground	
17	MICRO_RST_N	I	MCU_RST_N	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
18	MICRO_WAKEUP	O	MCU_WAKEUP	Vol: 0.4V Max Voh: 0.75VDD Min

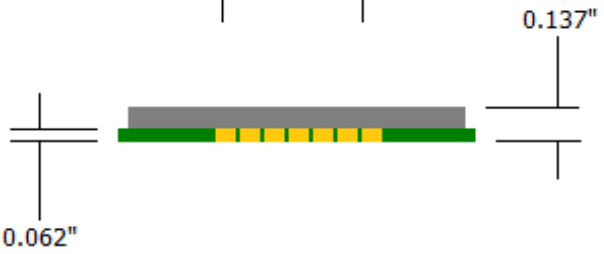
19	MICRO_ADC_IN1	I	MCU_ADC_1	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
20	SEL/ESC	I		Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
21	GND	-	-	-
22	DL/RUN_SEL	I	MCU enters download mode if this pin is pulled high. Normal operation if connected to low at power up	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4V
23	MICRO_GPIO0	I/O	MCU_ General Purpose I/O	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
24	MICRO_GPIO1	I/O	MCU_ General Purpose I/O	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
25	MICRO_SPI_MOSI	I	MCU_MOSI	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4
26	MICRO_SPI_MISO	O	MCU_MISO	Vol: 0.4V Max Voh 0.75VDD Min
27	MICRO_SPI_SCK	I	MCU_SCK	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4V
28	MICRO_SPI_SSN	I	MCU_SSN	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4V
29	GND	-	-	-
30	VDD_3V3	PWR	Input supply voltage	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
31	USB_DN	I/O	USB data minus	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
32	USB_DP	I/O	USB data plus	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
33	NC	-	-	-

RW8200 Module Mechanical Dimensions

Top View

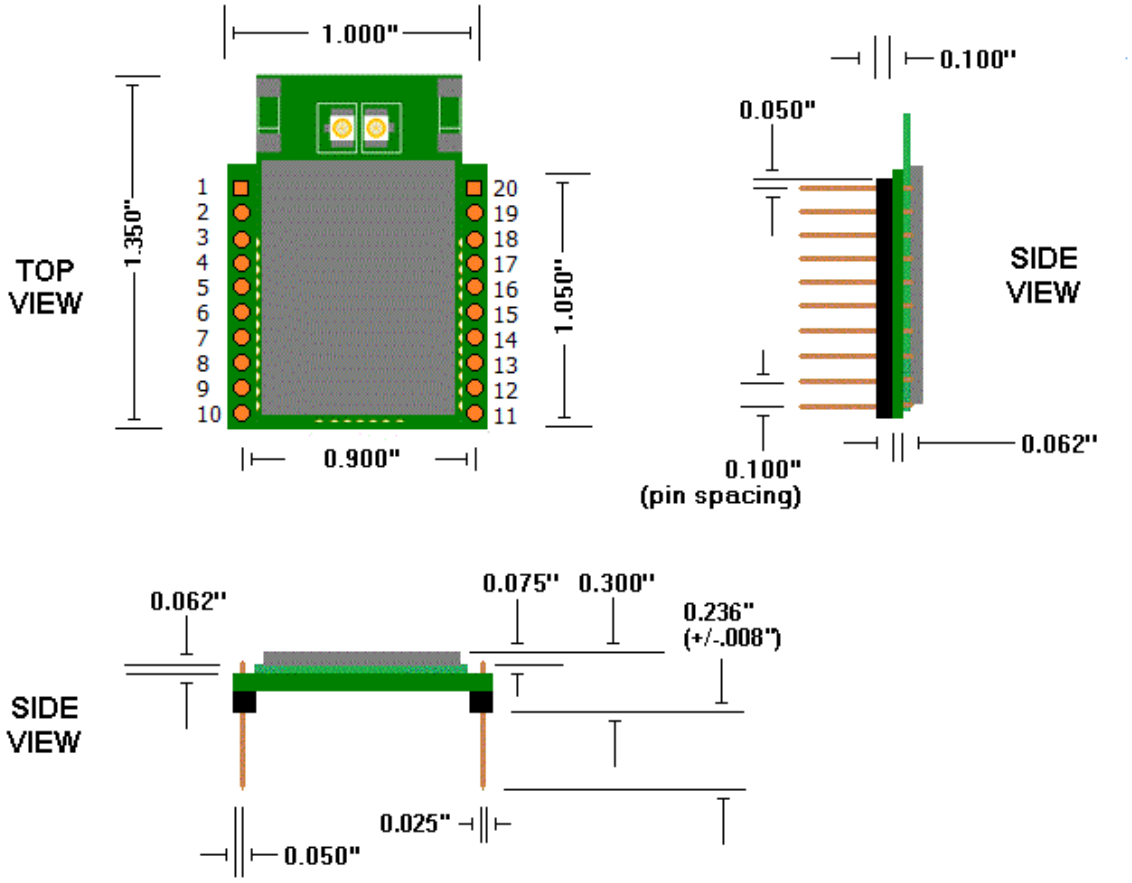


Side View



Board Size: 0.787" x 1.300" x 0.137"(20mm x 33mm x 3.5mm)
Pitch: 0.050" (1.27mm)
Pad Width: 0.036"(0.914mm)
Tolerance: +/- 0.0075" (0.118mm)

RW8200HM Series Mechanical Dimensions



Notes:

1. Pin spacing is 0.100" from center to center.
2. Dimension of the module - 1.00" x 1.35" x 0.30"
3. Pin 1 is not provided – Use as key
4. Suggested mating female connector: Samtec P/N. #SSW-110-21-G-S (RoHS Thru-Hole)
   Samtec P/N. #SSW-110-22-G-S-VS (RoHS SMT)
5. Square pins - 0.025" x 0.025"

RW8200HM Series Pin Descriptions

Pin #	Pin Name	Type	Description	I/O Voltage Range
1	NC	-	-	-
2	MICRO_GPIO1	I/O	MCU_ General Purpose I/O	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
3	NC	-	-	-
4	VDD_3V3	PWR	Supply voltage	3.15V ~ 3.6V
5	MICRO_RST_N	I	Reset if low for more than 5ms	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
6	GND	-	Ground	
7	USB_DN	I/O	USB data minus	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
8	USB_DP	I/O	USB data plus	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
9	MICRO_SPI_SCK	I	MCU_SCK	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4V
10	MICRO_SPI_MOSI	I	MCU_MOSI	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4
11	MICRO_SPI_SSN	I	MCU_SSN	Vil: -0.4V ~ 0.4V Vih: 0.7VDD ~VDD+0.4V
12	MICRO_SPI_MISO	O	MCU_MISO	Vol: 0.4V Max Voh 0.75VDD Min
13	SEL/ESC	I	SEL: In power up stage only set UART baud rate to 115200 if this pin is pulled low, otherwise using previous setting stored baud rate. ESC: In TCP mode only escape TCP mode while this pin is pull low.	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
14	NC	-	-	-
15	MICRO_ADC_IN1	I	MCU_ADC_1	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V
16	MICRO_GPIO0	I/O	MCU_ General Purpose I/O	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
17	NC	-	-	-
18	MICRO_UART_TX	O	MCU_UART _TX	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min
19	MICRO_UART_RX	I	MCU_UART _RX	Vil: -0.4V ~ 0.4V Vih: 0.75VDD ~VDD+0.4V Vol: 0.4V Max Voh 0.75VDD Min

Note: I/O is DTE not DCE.

Connecting the RW8200 to Your System

The RW8200 Modules are designed for easy connection to any standard Serial Port and wireless network. Connect one end of the RS232 cable into the DB9 connector on the RW8200MB and the other into any available COM port on your computer. The RW8200 module can work with any communication software without loading driver. Once turn on Terminal emulation program and select right speed and com port, The RW8200 is now ready for use.

The initial evaluation consists of the RW8200 Module mounted onto a RW8200HM. To remove the RW8200-HM: carefully remove it from the pin headers on the RW8200MB interface board. Save this interface board. The RW8200HM can always be reinstalled into the RW8200MB interface board and connected to any standard Serial port to verify or test the module functions.

If you use external antennae, connect Radicom approved antennae and cable(s) to the on board U.FL sockets. For ultimate performance, we recommend using two antennas to meet MIMO requirement with better adaptability for receiving. If only one antenna is used, it MUST be connected to the SMD antenna connector on the top of the RW8200 module.

To maintain compliance, make sure that you follow all of the requirements described in the compliance section of this document.

Antenna Information

The RW8200 can have either an ON Board Chip antennae or an U.FL connector for external antennae connections. For ultimate performance, we recommend using two antennae for MIMO single stream operation and use the modules antenna command to automatically select the best antenna location for optimum performance. The ON Board Chip antennae location can be identified by the ANT1 and ANT2 silkscreened legend next to them. The U.FL antenna connectors are identified by TP1 and TP2 silkscreen.

Antennae command Information:

Use 0 = ANTENNA 1 for ANT1 and TP1 locations
Use 1 = ANTENNA 2 for ANT2 and TP2 locations
Use 3 = AUTOANTENNA Selection to have the module automatically control the antennae for optimum performance.

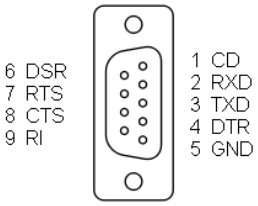
See section “Important Regulatory and Compliance Information” for additional restrictions and requirements for antenna usage.

RW8200MB Carrier Board RS232 DB-9 Pin Definitions

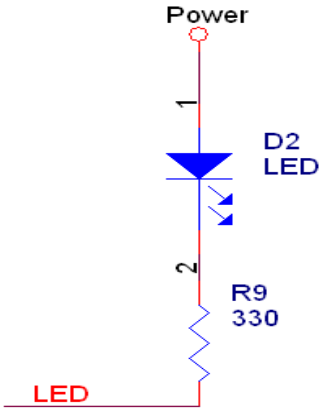
The pin definitions of DB9 used on the RW8200-MB RS232 Serial Connector are as follows:

1. DCD: Input, Carrier Detect
2. RXD: Input, Received Data
3. TXD: Output, Transmit data
4. DTR: Output, Data Terminal ready
5. GND: Ground
6 DSR: Input, Data Set Ready
7. RTS: Output, Request to Send
8. CTS: Input, Clear to Send
9. RI: Input, Ring Indicator


A male DE-9 connector.



LED Suggestion Circuit



FCC, IC, and CE Label Location and Module Model Identification

The RW8200 module family is FCC Part 15 and IC (Industry Canada) certified. The RW8200 series is also CE marked. The modules are labeled with theRW8200 series module model number and FCC Part 15 ID, IC registration number and CE mark. The label can be found on top of the metal shielding on the RW8200 Module.

FCC, IC, and CE Label Location and Module Model Identification

Radicom Research Inc.
Model: RW8200a
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Radicom Research Inc.
Model: RW8200c
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Radicom Research Inc.
Model: RW8200Ua
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Radicom Research Inc.
Model: RW8200Uc
FCC ID: K7T-RW8200
IC: 2377A-RW8200

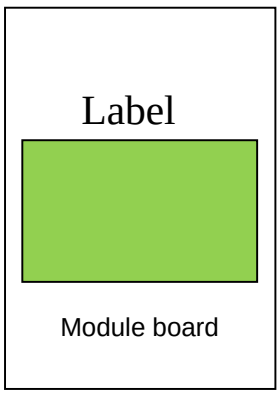
Radicom Research Inc.
Model: RW8200HMa
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Radicom Research Inc.
Model: RW 8200HMc
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Radicom Research Inc.
Model: BPM8200a
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Radicom Research Inc.
Model: BPM8200c
FCC ID: K7T-RW8200
IC: 2377A-RW8200

Location:



Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

IMPORTANT NOTE:
FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

1) The transmitter module may not be co-located with any other transmitter or antenna,

As long as 1 condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE
In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling
The final end product must be labeled in a visible area with the following:
“Contains FCC ID: **K7T- RW8200**

Manual Information to the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement:
This equipment complies with Canada portable RF exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This device is intended only for OEM integrators under the following conditions:

1) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 1 condition above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

1) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 1 condition ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

The final end product must be labeled in a visible area with the following:
Contains IC: **2377A- RW8200**

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:
Contient des IC: **2377A- RW8200**

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.
Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

CE Declaration of Conformity

For the following equipment:
Radicom Research Inc. Wi-Fi Module
Model(s): **RW8200a, RW8200c, RW8200Ua, RW8200Uc, RW8200HMa, RW8200HM c, BPM8200a, BPM8200c**
are herewith confirmed to comply with the requirements set out in the Council (European parliament) Directive on the Approximation of the Laws of the
Member States relating to Electromagnetic Compatibility of Radio and Telecom device (1999/5/CE).
For the evaluation regarding this Directive, the following standards were applied:

EN 300328 V1.8.1: 2012
EN 62311:2008(MPE)
EN 301489-1 V1.9.2:2011
EN 301489-17 V2.2.1:2012
EN 60601-1:2006/AC:2010

This equipment is marked with CE and can be used throughout the European community.

Europe – R&TTE Compliance Statement:

Hereby, Radicom Research Inc. declares that this equipment complies with the essential requirements and other relevant provisions of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of March 9, 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE).

WiFi Regulatory Domain Frequencies

The channel identifiers, channel center frequencies, and regulatory domains of each 22-MHz-wide channel are shown in following table.

Model: WiFiHU2 Family	Frequency (MHZ)	Regulatory Domains					
		Japan	ETSI	North America	Israel	France Outdoor	Mexico
1	2412	˅	˅	˅		˅	
2	2417	˅	˅	˅		˅	
3	2422	˅	˅	˅	˅	˅	
4	2427	˅	˅	˅	˅	˅	
5	2432	˅	˅	˅	˅	˅	
6	2437	˅	˅	˅	˅	˅	
7	2442	˅	˅	˅	˅	˅	
8	2447	˅	˅	˅	˅	˅	
9	2452	˅	˅	˅	˅	˅	
10	2457	˅	˅	˅			˅
11	2462	˅	˅	˅			˅
12	2467	˅	˅				
13	2472	˅	˅				
14	2484	˅					

Important features:

1. Antenna types

The RW8200 can have either an ON Board Chip antennae or an U.FL connector for external antennae connections.

2. Serial Port

The RW8200 supports serial port and can set baud rate from 1200 up to 921600 bps. The default speed is 115200bps with one start, 1stop and no parity bit. When power on, if pin 20 signal is pulled low, the default speed is 115200bps.

3. Command/data mode

To exit from data mode, you can issue an Escape sequence (+++) or use pin 20 of RW8200 module and RW8200-HM.

4. Flow control

No flow control is needed for Network protocol. The BPM8200 does not have flow control at all.

RW8200 COMMAND SET

Command	Parameter	Descriptions
?	0,	"Help menu"
help	0,	"Help menu"
ping,	0,	"<destination>" "Pings the specified IP or Host."
get_random,	0,	"Get a random number."
get_mac_addr,	0,	"Get the device MAC address."
get_rssi,	0,	"Get the received signal strength of the AP (client mode only)."
tcp_server,	0,	"Turn on TCP Server mode."
tcp_client,	1,	"Turn on TCP Client mode."
join,	2,	"<ssid><open|wpa|wpa2>[key][ip netmask gateway]" "Join an AP. DHCP assumed if no IP address provided"
join,	4,	"<ssid><open|wpa|wpa2><key>[ip netmask gateway]" "Join a specific AP. DHCP assumed if no IP address provided."
leave,	0,	"Leave an AP."
powersave,	1,	"Enable/disable power save mode."
scan,	0,	"Scan all enabled channels and print a list of APs found."
set_ip,	3,	"Set a static IP."
set_tx_power,	1,	"Set the tx power in dBm."
get_tx_power,	0,	"Gets the tx power in dBm."
status,	0,	"Print status of the WiFi and network

		interfaces.”
start_ap,	4,	“Start AP mode.”
stop_ap,	0,	“Stop AP mode.”
wifi_on,	0,	“Turn WiFi device on.”
wifi_off,	0,	“Turn WiFi device off.”
wifi_reset,	0,	“Reset the WiFi device.”
antenna,	1,	“Antenna selection. 3 = Auto”
set_country,	1,	“<country code>” “Set country.”

RW8200 COMMAND Detail

```
1.  ?               0, "Help menu"
                    (prompt)?

2.  help            0, "Help menu"
                    (prompt)HELP
          >
                    console Commands:
          help [<command> [<example_num>]]
               - Print help message or command example.
          dhcp
               - Perform DHCP as a client to obtain an IP address.
          get_mac_addr
               - Get the device MAC address
          get_rssi
               - Get the received signal strength of the AP (client mode only)
          join <ssid> <open|wpa|wpa2> [key] [ip netmask gateway]
               - Join an AP. DHCP assumed if no IP address provided
          join_specific <ssid> <bssid> <channel> <open|wpa|wpa2> <key> [ip
          netmask gateway]
               - Join a specific AP. DHCP assumed if no IP address provided
          leave
               - Leave an AP.
          Powersave <1|0>
               - Enable/Disable powersave mode.
          scan
               - Scan all enabled channels and print a list of APs found.
          set_ip <ip> <network> <gateway>
               -Set a static IP.
          set_tx_power <0-32>
               - Set the tx power in dBm.
          get_tx_power
               - Gets the rx power in dBm.
          status
               - Print status of the Wi-Fi and network interfaces.
          start_ap <ssid> <open|wpa|wpa2> <key> <channel>
               - Start AP mode
          stop_ap
               Stop AP mode
          wifi_on
               - Turn Wi-Fi device on.
```

```
            Wifi_off
                 - Turn Wi-Fi device off.
            wifi_reset
                 - Reset the Wi-Fi device
            antenna <0|1|2>
                 -Antenna selection. 3 = Auto
            set_country <country code>
                 - Set country.
            ping <destination>
                 - Pings the specificd IP or Host.
            get_random
                 - Get a random number.
            tcp_server
                 -Waits for connection from TCP client.
            tcp_client
                 -Initiate connection to TCP server.
    >


3.  ping,           0, "<destination>"
                    "Pings the specified IP or Host."

                    (prompt)ping 192.128.1.1
            >
                 Pinging: 191.128.1.1
            >
                 Pining Timeout


4.  get_random,      0, "Get a random number."

                    (prompt)get_random
            >
                 Random number is 24280
            >


5.  tcp_server,  0," Waits for connection from TCP client."

                (prompt)tcp_test_tx_server

6.  tcp_client,  0," Initiate connection to TCP server."

                (prompt)tcp_test_rx_server
```

```
7.  get_mac_addr,  0, "Get the device MAC address."

                   (prompt)get_mac_addr

          MAC address is : CC:52:AF:2A:58:8A


8.  get_rssi,      0, "Get the received signal strength of the AP (client mode
    only)."

                   (prompt)get_rssi

          RSSI is 0

9.  join          2, "<ssid> <open|wpa|wpa2> [key] [ip netmask gateway]"
                      "Join an AP. DHCP assumed if no IP address provided"

                      (prompt)join

10. join_specific, 4, "<ssid> <bssid> <channel> <open|wpa|wpa2> <key> [ip
    netmask gateway]"
               "Join a specific AP. DHCP assumed if no IP address provided"

                      (prompt)join_specific

11. leave,         0, "Leave an AP."

                          (prompt)leave

          >

12. powersave,     1, "Enable/disable powersave mode."

                          (prompt)powersave

          >

13. scan,       0, "Scan all enabled channels and print a list of APs found."

                          (prompt)scan

                    SSID            : Business
                    BSSID           : 00:1E:00:10:10:10
                    RSSI            : -58dBm
                    Max Data Rate   : 54.0 Mbits/s
                    Network Type    : Infrastructure
                    Security        : WPA
                    Radio Band      : 2.4GHz
                    Channel         : 11

14. set_ip,        3, "Set a static IP."

                          (prompt)set_ip

15. set_tx_power,  1, "Set the tx power in dBm."

                          (prompt)set_tx_power
```

```
16. get_tx_power,  0, "Gets the tx power in dBm."

                        (prompt)get_tx_power

17. status,        0, "Print status of the Wi-Fi and network interfaces."

                        (prompt)status
                    >
                        WICED Version    : 1.2.10956
                        Platform         : BCM94319WICED5
                        MAC address      : CC:52:AF:2A:58:8A
                        STA Interface    : Down
                        AP Interface     : Down
                    >

18. start_ap,      4, "Start AP mode."

                        (prompt)start_ap

19. stop_ap,       0, "Stop AP mode."

                        (prompt)stop_ap

20. wifi_on,       0, "Turn Wi-Fi device on."

                        (prompt)wifi_on

21. wifi_off,      0, "Turn Wi-Fi device off."

                        (prompt)wifi_off
          >
          Wi-Fi is now off. Calling further Wi_Fi function will cause system
          instability.

22. wifi_reset,    0, "Reset the Wi-Fi device."

                        (prompt)reset the Wi-Fi device

23. antenna,       1, "Antenna selection. 3 = Auto"
              0 = ANTENNA 1 (default)
              1 = ANTENNA 2
              3 = AUTOANTENNA SELECTION

                        (prompt)antenna 1
          >
24. set_country,   1, "<country code>"
                      "Set country."

                        (prompt)set_country A,L
    >
------------------------------Country Code---------------------------------

    AFGHANISTAN                          /* AF Afghanistan */
    ALBANIA                              /* AL Albania */
    ALGERIA                              /* DZ Algeria */
    AMERICAN_SAMOA                       /* AS American_Samoa */
    ANGOLA                               /* AO Angola */
    ANGUILLA                             /* AI Anguilla */
```

```
ANTIGUA_AND_BARBUDA                     /* AG Antigua_and_Barbuda */
ARGENTINA                               /* AR Argentina */
ARMENIA                                 /* AM Armenia */
 ARUBA                                  /* AW Aruba */
AUSTRALIA                               /* AU Australia */
AUSTRIA                                 /* AT Austria */
AZERBAIJAN                              /* AZ Azerbaijan */
BAHAMAS                                 /* BS Bahamas */
BAHRAIN                                 /* BH Bahrain */
BAKER_ISLAND                            /* 0B Baker_Island */
BANGLADESH                              /* BD Bangladesh */
BARBADOS                                /* BB Barbados */
BELARUS                                 /* BY Belarus */
BELGIUM                                 /* BE Belgium */
BELIZE                                  /* BZ Belize */
BENIN                                   /* BJ Benin */
BERMUDA                                 /* BM Bermuda */
BHUTAN                                  /* BT Bhutan */
BOLIVIA                                 /* BO Bolivia */
BOSNIA_AND_HERZEGOVINA                  /* BA Bosnia_and_Herzegovina */
BOTSWANA                                /* BW Botswana */
BRAZIL                                  /* BR Brazil */
BRITISH_INDIAN_OCEAN_TERRITORY      /* IO British_Indian_Ocean_Territory */
BRUNEI_DARUSSALAM                       /* BN Brunei_Darussalam */
BULGARIA                                /* BG Bulgaria */
BURKINA_FASO                            /* BF Burkina_Faso */
BURUNDI                                 /* BI Burundi */
CAMBODIA                                /* KH Cambodia */
CAMEROON                                /* CM Cameroon */
CANADA                                  /* CA Canada */
CAPE_VERDE                              /* CV Cape_Verde */
CAYMAN_ISLANDS                          /* KY Cayman_Islands */
CENTRAL_AFRICAN_REPUBLIC                /* CF Central_African_Republic */
CHAD                                    /* TD Chad */
CHILE                                   /* CL Chile */
CHINA                                   /* CN China */
CHRISTMAS_ISLAND                        /* CX Christmas_Island */
COLOMBIA                                /* CO Colombia */
COMOROS                                 /* KM Comoros */
CONGO                                   /* CG Congo */
CONGO_THE_DEMOCRATIC_REPUBLIC_OF_THE    /* CD Congo,
                                        _The_Democratic_Republic_Of_The */
COSTA_RICA                              /* CR Costa_Rica */
COTE_DIVOIRE                            /* CI Cote_D'ivoire */
CROATIA                                 /* HR Croatia */
CUBA                                    /* CU Cuba */
CYPRUS                                  /* CY Cyprus */
CZECH_REPUBLIC                          /* CZ Czech_Republic */
DENMARK                                 /* DK Denmark */
DJIBOUTI                                /* DJ Djibouti */
DOMINICA                                /* DM Dominica */
DOMINICAN_REPUBLIC                      /* DO Dominican_Republic */
ECUADOR                                 /* EC Ecuador */
EGYPT                                   /* EG Egypt */
EL_SALVADOR                             /* SV El_Salvador */
EQUATORIAL_GUINEA                       /* GQ Equatorial_Guinea */
ERITREA                                 /* ER Eritrea */
ESTONIA                                 /* EE Estonia */
```

```
ETHIOPIA                                /* ET Ethiopia */
FALKLAND_ISLANDS_MALVINAS               /* FK Falkland_Islands_(Malvinas) */
FAROE_ISLANDS                           /* FO Faroe_Islands */
FIJI                                    /* FJ Fiji */
FINLAND                                 /* FI Finland */
FRANCE                                  /* FR France */
FRENCH_GUINA                            /* GF French_Guina */
FRENCH_POLYNESIA                        /* PF French_Polynesia */
FRENCH_SOUTHERN_TERRITORIES             /* TF French_Southern_Territories */
GABON                                   /* GA Gabon */
GAMBIA                                  /* GM Gambia */
GEORGIA                                 /* GE Georgia */
GERMANY                                 /* DE Germany */
GHANA                                   /* GH Ghana */
GIBRALTAR                               /* GI Gibraltar */
GREECE                                  /* GR Greece */
GRENADA                                 /* GD Grenada */
GUADELOUPE                              /* GP Guadeloupe */
GUAM                                    /* GU Guam */
GUATEMALA                               /* GT Guatemala */
GUERNSEY                                /* GG Guernsey */
GUINEA                                  /* GN Guinea */
GUINEA_BISSAU                           /* GW Guinea-bissau */
GUYANA                                  /* GY Guyana */
HAITI                                   /* HT Haiti */
HOLY_SEE_VATICAN_CITY_STATE           /* VA Holy_See_(Vatican_City_State) */
HONDURAS                                /* HN Honduras */
HONG_KONG                               /* HK Hong_Kong */
HUNGARY                                 /* HU Hungary */
ICELAND                                 /* IS Iceland */
INDIA                                   /* IN India */
INDONESIA                               /* ID Indonesia */
IRAN_ISLAMIC_REPUBLIC_OF                /* IR Iran,_Islamic_Republic_Of */
IRAQ                                    /* IQ Iraq */
IRELAND                                 /* IE Ireland */
ISRAEL                                  /* IL Israel */
ITALY                                   /* IT Italy */
JAMAICA                                 /* JM Jamaica */
JAPAN                                   /* JP Japan */
JERSEY                                  /* JE Jersey */
JORDAN                                  /* JO Jordan */
KAZAKHSTAN                              /* KZ Kazakhstan */
KENYA                                   /* KE Kenya */
KIRIBATI                                /* KI Kiribati */
KOREA_REPUBLIC_OF                       /* KR Korea,_Republic_Of */
KOSOVO                                  /* 0A Kosovo */
KUWAIT                                  /* KW Kuwait */
KYRGYZSTAN                              /* KG Kyrgyzstan */
LAO_PEOPLES_DEMOCRATIC_REPUBIC       /* LA Lao_People's_Democratic_Republic */
LATVIA                                  /* LV Latvia */
LEBANON                                 /* LB Lebanon */
LESOTHO                                 /* LS Lesotho */
LIBERIA                                 /* LR Liberia */
LIBYAN_ARAB_JAMAHIRIYA                  /* LY Libyan_Arab_Jamahiriya */
LIECHTENSTEIN                           /* LI Liechtenstein */
LITHUANIA                               /* LT Lithuania */
LUXEMBOURG                              /* LU Luxembourg */
```

```
MACAO                                    /* MO Macao */
MACEDONIA_FORMER_YUGOSLAV_REPUBLIC_OF    /* MK Macedonia,
                                         _Former_Yugoslav_Republic_Of */
MADAGASCAR                               /* MG Madagascar */
MALAWI                                   /* MW Malawi */
MALAYSIA                                 /* MY Malaysia */
MALDIVES                                 /* MV Maldives */
MALI                                     /* ML Mali */
MALTA                                    /* MT Malta */
MAN_ISLE_OF                              /* IM Man,_Isle_Of */
MARTINIQUE                               /* MQ Martinique */
MAURITANIA                               /* MR Mauritania */
MAURITIUS                                /* MU Mauritius */
MAYOTTE                                  /* YT Mayotte */
MEXICO                                   /* MX Mexico */
MICRONESIA_FEDERATED_STATES_OF     /* FM Micronesia,_Federated_States_Of */
MOLDOVA_REPUBLIC_OF                      /* MD Moldova,_Republic_Of */
MONACO                                   /* MC Monaco */
MONGOLIA                                 /* MN Mongolia */
MONTENEGRO                               /* ME Montenegro */
MONTSERRAT                               /* MS Montserrat */
MOROCCO                                  /* MA Morocco */
MOZAMBIQUE                               /* MZ Mozambique */
MYANMAR                                  /* MM Myanmar */
NAMIBIA                                  /* NA Namibia */
NAURU                                    /* NR Nauru */
NEPAL                                    /* NP Nepal */
NETHERLANDS                              /* NL Netherlands */
NETHERLANDS_ANTILLES                     /* AN Netherlands_Antilles */
NEW_CALEDONIA                            /* NC New_Caledonia */
NEW_ZEALAND                              /* NZ New_Zealand */
NICARAGUA                                /* NI Nicaragua */
NIGER                                    /* NE Niger */
NIGERIA                                  /* NG Nigeria */
NORFOLK_ISLAND                           /* NF Norfolk_Island */
NORTHERN_MARIANA_ISLANDS                 /* MP Northern_Mariana_Islands */
NORWAY                                   /* NO Norway */
OMAN                                     /* OM Oman */
PAKISTAN                                 /* PK Pakistan */
PALAU                                    /* PW Palau */
PANAMA                                   /* PA Panama */
PAPUA_NEW_GUINEA                         /* PG Papua_New_Guinea */
PARAGUAY                                 /* PY Paraguay */
PERU                                     /* PE Peru */
PHILIPPINES                              /* PH Philippines */
POLAND                                   /* PL Poland */
PORTUGAL                                 /* PT Portugal */
PUETO_RICO                               /* PR Pueto_Rico */
QATAR                                    /* QA Qatar */
REUNION                                  /* RE Reunion */
ROMANIA                                  /* RO Romania */
RUSSIAN_FEDERATION                       /* RU Russian_Federation */
RWANDA                                   /* RW Rwanda */
SAINT_KITTS_AND_NEVIS                    /* KN Saint_Kitts_and_Nevis */
SAINT_LUCIA                              /* LC Saint_Lucia */
SAINT_PIERRE_AND_MIQUELON                /* PM Saint_Pierre_and_Miquelon */
```

```
SAINT_VINCENT_AND_THE_GRENADINES  /* VC Saint_Vincent_and_The_Grenadines */
 SAMOA                              /* WS Samoa */
 SANIT_MARTIN_SINT_MARTEEN          /* MF Sanit_Martin_/_Sint_Marteen */
 SAO_TOME_AND_PRINCIPE              /* ST Sao_Tome_and_Principe */
 SAUDI_ARABIA                       /* SA Saudi_Arabia */
 SENEGAL                            /* SN Senegal */
 SERBIA                             /* RS Serbia */
 SEYCHELLES                         /* SC Seychelles */
 SIERRA_LEONE                       /* SL Sierra_Leone */
 SINGAPORE                          /* SG Singapore */
 SLOVAKIA                           /* SK Slovakia */
 SLOVENIA                           /* SI Slovenia */
 SOLOMON_ISLANDS                    /* SB Solomon_Islands */
 SOMALIA                            /* SO Somalia */
 SOUTH_AFRICA                       /* ZA South_Africa */
 SPAIN                              /* ES Spain */
 SRI_LANKA                          /* LK Sri_Lanka */
 SURINAME                           /* SR Suriname */
 SWAZILAND                          /* SZ Swaziland */
 SWEDEN                             /* SE Sweden */
 SWITZERLAND                        /* CH Switzerland */
 SYRIAN_ARAB_REPUBLIC               /* SY Syrian_Arab_Republic */
 TAIWAN_PROVINCE_OF_CHINA           /* TW Taiwan,_Province_Of_China */
 TAJIKISTAN                         /* TJ Tajikistan */
 TANZANIA_UNITED_REPUBLIC_OF       /* TZ Tanzania,_United_Republic_Of */
 THAILAND                           /* TH Thailand */
 TOGO                               /* TG Togo */
 TONGA                              /* TO Tonga */
 TRINIDAD_AND_TOBAGO                /* TT Trinidad_and_Tobago */
 TUNISIA                            /* TN Tunisia */
 TURKEY                             /* TR Turkey */
 TURKMENISTAN                       /* TM Turkmenistan */
 TURKS_AND_CAICOS_ISLANDS           /* TC Turks_and_Caicos_Islands */
 TUVALU                             /* TV Tuvalu */
 UGANDA                             /* UG Uganda */
 UKRAINE                            /* UA Ukraine */
 UNITED_ARAB_EMIRATES               /* AE United_Arab_Emirates */
 UNITED_KINGDOM                     /* GB United_Kingdom */
 UNITED_STATES                      /* US United_States */
 UNITED_STATES_NO_DFS               /* Q2 United_States_(No_DFS) */
 UNITED_STATES_MINOR_OUTLYING_ISLANDS  /* UM United_States_Minor_
                                    Outlying_Islands */
```

```
URUGUAY                                 /* UY Uruguay */
UZBEKISTAN                              /* UZ Uzbekistan */
VANUATU                                 /* VU Vanuatu */
VENEZUELA                               /* VE Venezuela */
VIET_NAM                                /* VN Viet_Nam */
VIRGIN_ISLANDS_BRITISH                  /* VG Virgin_Islands,_British */
VIRGIN_ISLANDS_US                       /* VI Virgin_Islands,_U.S. */
WALLIS_AND_FUTUNA                       /* WF Wallis_and_Futuna */
WEST_BANK                               /* 0C West_Bank */
WESTERN_SAHARA                          /* EH Western_Sahara */
YEMEN                                   /* YE Yemen */
ZAMBIA                                  /* ZM Zambia */
ZIMBABWE                                /* ZW Zimbabwe */
```

RW8200 Special atbp Command Set

```
a: ip address
atbp a 192 168 1 1 (space for each arguments)

c: country setting
atbp c 123 (see country table for different country setting)

d: dhcp enable
atbp d 0 (disable dhcp, other value will turn on dhcp)

g: gateway address
atbp g 192 168 1 0 (space for each arguments)

i: ap ssid
atbp i RADICOM (SSID is RADICOM)

m: address mask
atbp m 255 255 255 0 (space for each arguments)

p: paraphrase
atbp p 12345678 (12345678 is the key)

s: security type
atbp s 0 (0: no security)

t: tcp listen tx port
atbp t 3490 (for tcp tx port 3490)

u: tcplisten rx port
atbp u 3490 (for tcp rx port 3490)

o: save current settings
atbp o (save current settings into flash which will be loaded
starting next power reset)

z: load and apply settings
atbp z (load and apply settings stored in flash)

f: factory default
atbp f (Use factory default settings)

v: display setting
atbp v (display setting)

b: baud rate setting
atbp b n (n=0: 9600; 1: 19200; 2: 38400; 3: 57600; 4: 115200; 5:
230400; 6: 460800; 7: 921600)
```

Operation examples

1. Example of connecting to 192.168.0.2 client of TCP port 3490 enter command to RW8200 as following:

```
>join SSID wpa2 xxxxxxxxx

>joining:SSID

Failed to join:SSID …retrying
Successfully joined:SSID
Obtaining IP address via DHCP
Network ready IP:192.168.0.104

>tcp_server

Server ready listening on port 3490
```

```
* Make sure send data to keep TCP port alive.
```

2. Example of connecting to 192.168.0.2 client of TCP port 3490 as following:

```
>join SSID wpa2 xxxxxxxxx

>joining:SSID

Failed to join: SSID …retrying
Successfully joined:SSID
Obtaining IP address via DHCP
Network ready IP:192.168.0.104

>tcp_client 192.168.0.2
```

```
* Make sure send data to keep TCP port alive.
```

3. Example of how to test the start_ap command as following:

```
1. Prepare 2 BPM8200 and download the V1.0C4 above
   firmware

2. Choose any one and setup and AP
>start_ap BPM8200 open 00000000 0

3. Use other BPM8200 join to BPM8200
   a. >scan
          make sure our BPM8200 is visible
   b. >join BPM8200 open 00000000 <IP> <Netmask>
      <Gateway>
```

4. One BPM8200 execute tcp_server command, and other execute tcp_client <AP's IP>
5. Now, we can send data from one BPM8200's console and display data in other.

4. Example of atbp v response as following:

```
>atbp v

AP-SSID: RADICOM
Security Type: 6
AP passphrase: YOUR_AP_PASSPHRASE
Country Setting: 21825
DHCP ENABLE: 1
IP ADDRESS: 192.168.1.95
GATEWAY ADDRESS: 192.168.1.1
IP MASK: 255.255.255.0
CHANNEL: 1
JOIN TIMEOUT: 10000
LOCAL UDP PORT: 50007
TARGET UDP PORT: 50007
TCP LISTEN TX PORT: 3490
TCP LISTEN RX PORT: 3490
DEFAULT SERVER IP: 192.168.0.90
```

5. Example of scan response as following:

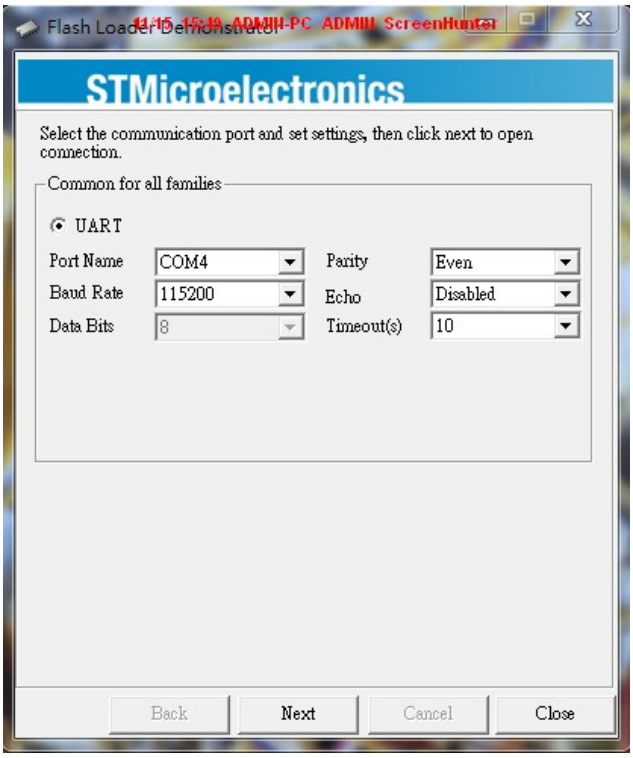
```
>scan

SSID: Business
BSSID: 00:1E:00:10:10:10
RSSI: -58dBm
Max Data Rate: 54.0 Mbits/s
Network Type: Infrastructure
Security: WPA
Radio Band: 2.4GHz
                    Channel: 11
```

Upgrade Firmware for RW8200-MB

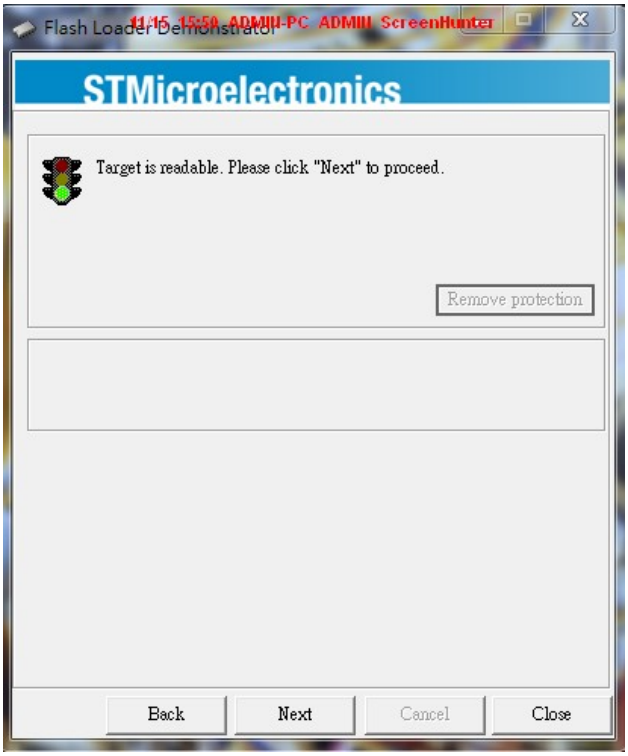
1. Install STMicroelectronics “Flash Loader Demonstrator” program.

2. Enable RW8200-MB to be Uart D/L mode (ADC3 pulled high)

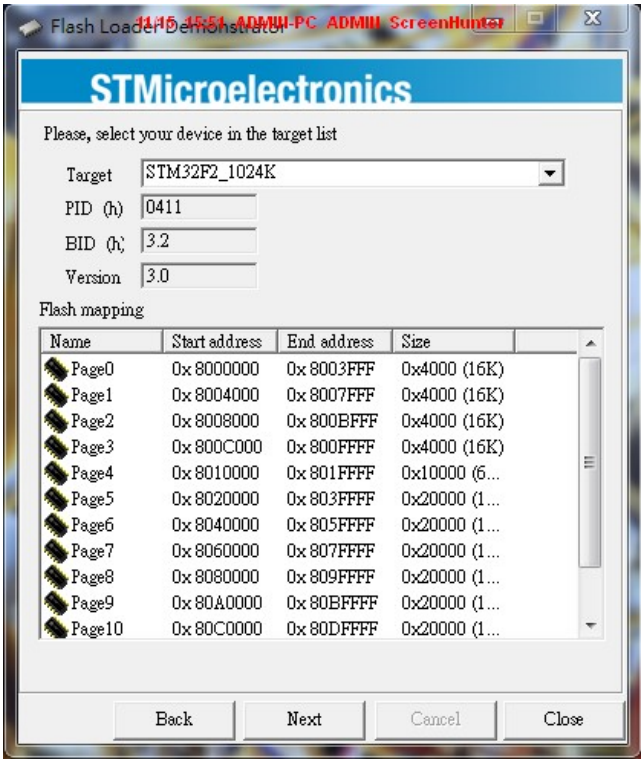
3. Reset RW8200-MB, execute “Flash Loader Demonstrator” w/ correct COM port selected, press [Next]



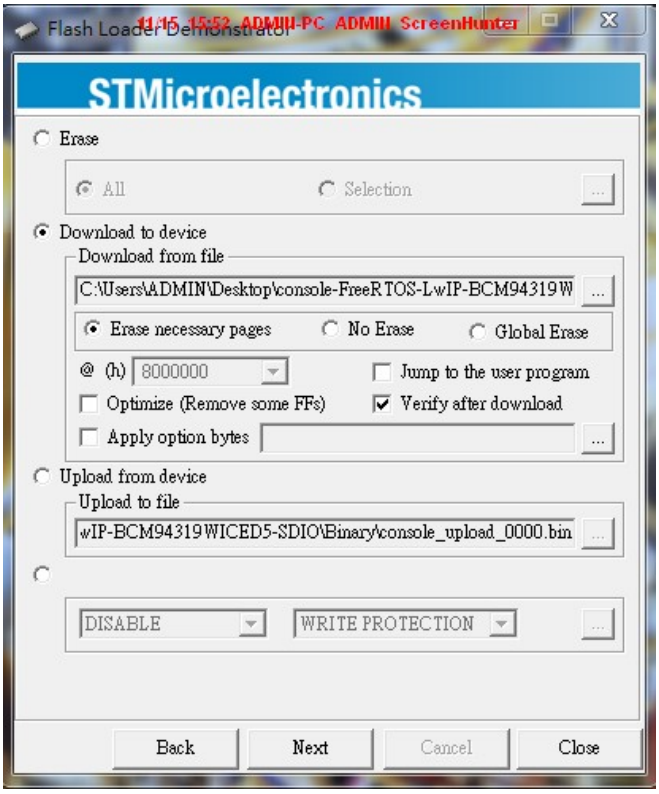
4. “Target available...” should be displayed (as below), press [Next]; if not, close the program and repeat step #3



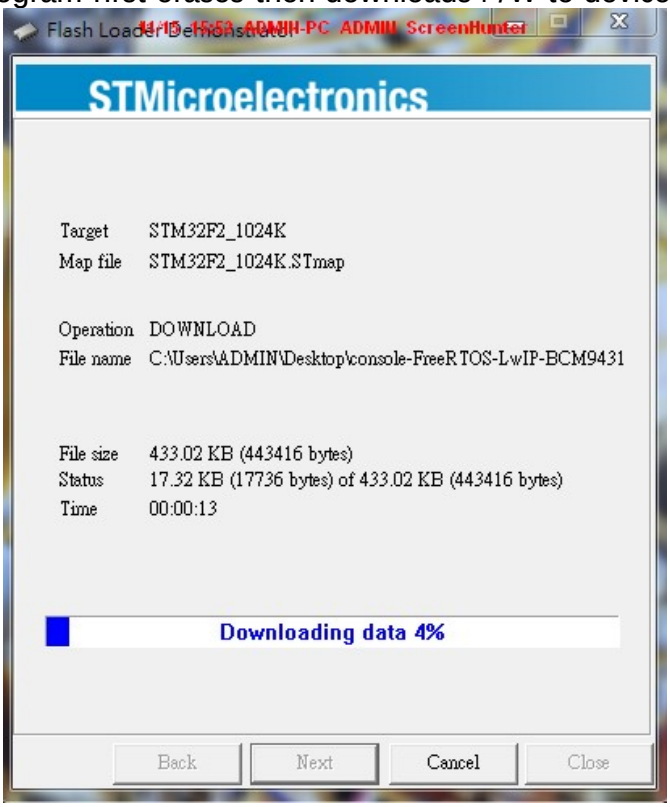
5. From the “Target” pull-down menu, choose “STMF32F2_1024K”, press [Next]

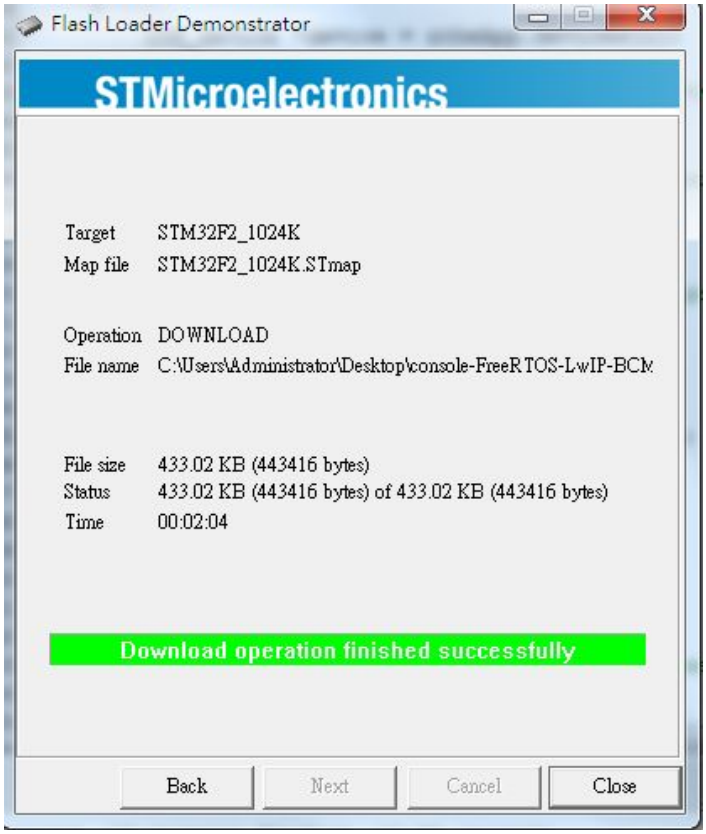


6. Specify the to-be-upgraded F/W path (the example shows “console-FreeRTOS-LwIP-BCM94319WICED5-SDIO.hex”), press [Next]



7. Flash Loader program first erases then downloads F/W to device




Flash Loader Demonstrator
STMicroelectronics
Target STM32F2_1024K
Map file STM32F2_1024K.STmap
Operation DOWNLOAD
File name C:\Users\Administrator\Desktop\console-FreeRTOS-LwIP-BCM
File size 433.02 KB (443416 bytes)
Status 433.02 KB (443416 bytes) of 433.02 KB (443416 bytes)
Time 00:02:04
Download operation finished successfully
Back
Next
Cancel
Close

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(c) Defects of damage from improper testing, operation, maintenance, installation, alteration, modification or adjustment.
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