WiFi RS-232 Adapter

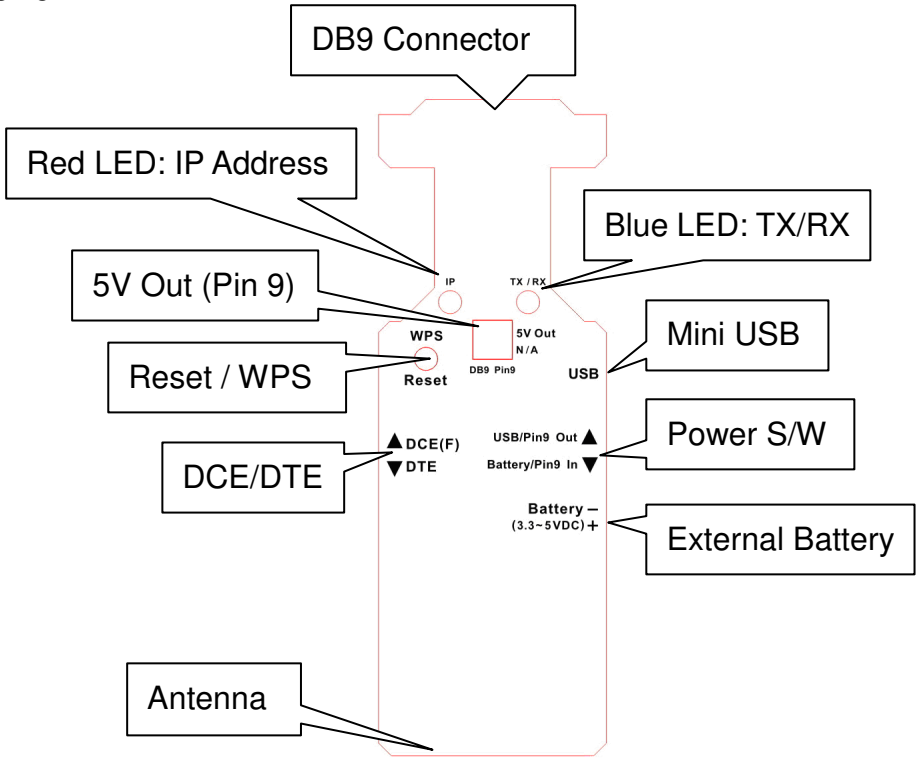
1. Package Contents:

- WiFi RS-232 adapter x 1
- Battery power line with connector x 1
- User manual x 1
- USB Cable x 1
- 2 dBi Dipole Antenna x 1

White box: Dimension: 10 x 5.5 x 5 (cm)

Weight: 122 g

2. Product profile:



3. Power supply:

3.1 Input

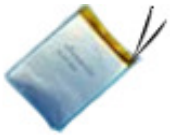
3.1.1 Mini USB: The USB cable is included in the package

3.1.2 DB9 Pin 9: 5VDC input, please select power S/W to “Power in” side.

3.1.3 External battery

- Standard A, AA or AAA battery: 3 units for each model.

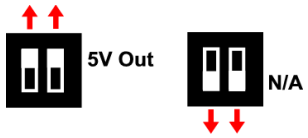
- Li-Polymer Battery: 3~3.7 VDC. The capacity depends on the applications. General working power consumption: 100 mAh (for reference)



3.2 Output

The Pin 9 of DB9 will output 5VDC with 1 A Max. to external devices. Please slide the DIP switch

to “5V Out” direction on the top hole before use the function.



4. Reset/WPS button:

4.1 Reset to factory default value: Please check the section 11 on page 6.

4.2 Launch the different applications when the reset button is pressed, please set the following command.

- set sys launch_string web_app // Launches web server (default)
- set sys launch_string wps_app // Launches WPS app
- set sys launch_string eap_app // Launches EAP app

5. Default setting of the COM port:

- Baud rate: 9600 bps
- Data bit: 8
- Parity: none
- Stop bit: 1
- Flow control: none

Restore the factory settings by the “Reset” button for 5 times by using a clip or pin into the hole. Please check the procedures of the section 11 on page 6.

6. DCE/DTE Slide Switch:

- DCE: data communication Equipment, EX: Modem
- DTE: data terminal equipment

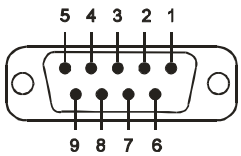
Use the slide switch to swap the TX and RX direction. By default, the DCE side which towards the DB9 connector side.

7. LED Status:

Condition	**Red LED**	**Blue LED**
On solid	Connected over TCP	
Fast blink	No IP address	RX/TX data transfer
Slow blink	IP address OK	

8. RS232 Interface:

8.1 Pin-out:



8.2 Signals:

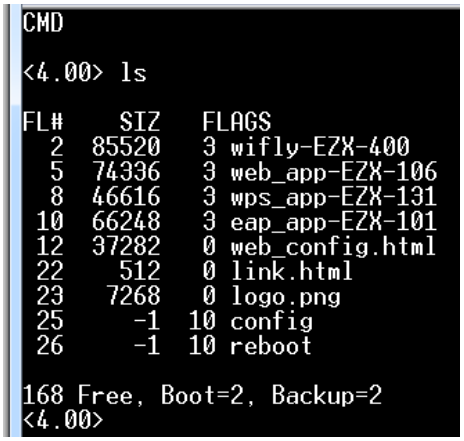
Pin	**Signal**	**DTE**	**DCE**	**Description**
1	CD	Input	Output	Not connected
2	TxD	Output	Input	Transmitted data
3	RxD	Input	Output	Received data

4	DSR	Input	Output	Contact manufacturer to set this
5	GND	N/A	N/A	Signal ground
6	DTR	Output	Input	Contact manufacturer to set this
7	CTS	Input	Output	Clear to send
8	RTS	Output	Input	Request to send (Default)
9	Vout	Output	Output	Power output to Pin 9 of DB9 connector (5VDC, 1.5A Max.), please slide the DIP switch toward the “5V Out” direction (Section 4)

9. Command set (The firmware version is V4.0 which is announced on 27 March, 2013)

9.1 Data mode & Command mode

- Launch commad mode
- Run Tera Term
- Open the assigned COM port
- Serial port settings: 9600 baud, 8 bits, No Parity, 1 stop bit
- Type “$$$” enter into the command mode (NOTE: The escape sequence is $$$ ONLY. There is no carriage return or line feed after the third dollar sign. Once in command mode, all commands terminate with a carriage return.)
- Module will respond with <CMD>
- Press ENTER will display<4.00>
- “ls” command will display all the firmware images.



Description:

wifly-EZX-400	Firmware image files (.img)	Filenames starting in wifly are typically firmware images.
web_app-EZX-106 wps_app-EZX-131 eap_app-EZX-101	Application files	These application files are used for specific module features.
web_config.html link.html	HTML files	These files are used for the configuration web server feature.
logo.png	Logo file	Logo displayed on web pages. Used for the configuration web server feature.
config	Configuration file	The config file stores the module’s boot up parameters.

9.2 Configuration setting

- Changes are persistent and are reloaded after power cycling
- Changes are kept using the “SAVE“ command
- Many settings require a reboot to take effect.

9.3 Command rules

- Case sensitive
- Spaces cannot be used, a “$“ is a substitute. e.g. “MY NETWORK” = “MY$NETWORK”

9.4 Shorthand's can be used

- set uart baudrate 115200 (valid)
- set uart b 115200 (valid)
- set u b 115200 (valid)
- s uart baudrate 115200 (NOT valid)

9.5 Command type (The details are listed on the document of command set)

9.5.1 Set: Immediate effect, permanent if saved to config file

Set Command	Function
AdHoc	controls the adhoc parameters
Broadcast	controls the broadcast hello/heartbeat UDP message
COMM	communication and data transfer, matching characters
DNS	DNS host and domain
FTP	FTP host address and login information
IP	IP settings
Option	optional and not frequently used parameters
Sys	system settings such as sleep and wake timers
Time	Real time clock settings
UART	serial port settings such as baudrate and parity
WLAN	wireless interface, such as SSID, chan, and security options

9.5.2 Get: Retrieve and display the permanently stored information

9.5.3 Status: Current status of interface, IP address, etc.

9.5.4 Action: Perform actions such as scan, connect, disconnect

9.5.5 File: Upgrade, load and save configuration, delete files, etc.

9.6 Networking

9.6.1 Search for networks

- $$$ // Enter command mode
- scan

9.6.2 Join a network

- set wlan ssid <string> // Please key in the ssid of AP
- set wlan pass <string> // Please key in the password of AP
- join # 01 // “01” is the no. comes from the step 9.6.1 (remember the spaces)

```
<4.00> scan
<4.00>
SCAN:Found 1
01,02,-43,04,1104,28,c0,74:72:f2:0d:6f:23,Wireless 11n AP
END:
set wlan ssid Wireless 11n AP
AOK
<4.00> set wlan pass 2iuijlgi
AOK
<4.00> save
Storing in config
<4.00> join # 01
Auto-Assoc Wireless 11n AP chan=2 mode=MIXED SCAN OK
<4.00> Joining Wireless 11n AP now..
Associated!
DHCP: Start
DHCP in 5264ms, lease=864000s
IF=UP
DHCP=ON
IP=192.168.173.101:2000
NM=255.255.255.0
GW=192.168.173.1
Listen on 2000
*OPEN*
```

9.6.3 AP mode: The default mode is SoftAP. The users will connect the AP directly w/o password and will be assigned with one IP address. The AP support DHCP which will assign one IP address to the Android, NB and iPhone shown on the picture.

```
MAC Addr=00:06:66:51:d3:ff
*READY*
AP mode as WiFly-EZX-ff on chan 1
Listen on 2000
DCHP Server Init
PIN9=1
DHCP: 1.2.3.14 lease to android-fec83655
DHCP: 1.2.3.15 lease to *
DHCP: 1.2.3.16 lease to May-teki-iPhone
```

9.6.4 Web-APP: Launches the web server by press the “Reset/WPS” button. Please check the section 4.2 on page 2.

```
<4.00> WiFly WebConfig v1.06 Mar 27 2013 13:59:06 on RN-171
Mac Addr=00:06:66:51:d3:ff
*READY*
AP mode as WiFly-EZX-ff on chan 1
DCHP Server Init
(Re)Starting HTTP Webserver
Creating server pcb on port: 80
Listen on 80
(Re)Starting DNS server
Creating server pcb on port: 53
DHCP: 1.2.3.14 lease to *

<WEB_APP-1.06>
```

9.6.5 WPS (Wi-Fi Protected Setup): WPS is a standard for easy and secure establishment of a wireless network via WiFi. The most common mode of WPS is the Push Button Mode (PBC) in which the user simply pushes a button on both the AP and the wireless client, the RS-232 adapter. There’re two ways to launch the WPS App.

- From the console, use the “run wps” command
- Push the “WPS” button on the top of the RS-232 adapter by the clip, please set the launch application command first on the page 2 section 4.2.
  - set sys launch_string wps_app // Launches WPS app by press the “Reset/WPS” button.

Remark: Scan format updated to show AP that support WPS:

```
SCAN:Found 7
Num      SSID     Ch  RSSI   Sec     MAC Address      Suites
 1          g2  01 -67 WPA2PSK 00:15:f9:38:bd:b0 AESM-AES   3104
 2  SensorNet  01 -50 WPA2PSK 00:22:3f:6b:95:42 AESM-AES  WPSPB 1100
 3   roving1  01 -58 WPA2PSK e0:91:f5:57:a3:54 AESM-AES   3100
 4  Belkin.40E9  06 -30 WPA2PSK 94:44:52:97:20:e9 AESM-AES  WPSPB 1104
 5     linksys  06 -76    Open 00:1e:e5:67:73:b1   WPSPB  104
 6     default  06 -76    Open 00:18:02:70:7e:e8   WPSPB 2100
 7   portthru  10 -52    Open 42:2b:fd:48:d4:8e  Adhoc   200
```

In the above diagram, the APs that support WPS are listed with WPSPB in the security suites. When the WPS button is pushed on an AP, it will show up as –A shown below.

```
SCAN:Found 4
Num      SSID     Ch  RSSI   Sec     MAC Address      Suites
 1  SensorNet  01 -52 WPA2PSK 00:22:3f:6b:95:42 AESM-AES  WPSPB 1104
 2  Belkin.40E9  06 -28 WPA2PSK 94:44:52:97:20:e9 AESM-AES  WPSPB-A 1104
 3     linksys  06 -72    Open 00:1e:e5:67:73:b1   WPSPB  104
 4     default  06 -75    Open 00:18:02:70:7e:e8   WPSPB 2100
```

9.7 COM Port Setting

- set uart baud <rate> set the UART baud rate. Valid settings are {2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600}.
  Example: “set u b 9600” sets the baud rate to 9600 baud..
- set uart flow <0,1> sets the flow control mode. Default=0=Disabled, 1= hardware RTS/CTS.
  NOTE: Once flow control is enabled, it is important to properly drive the CTS pin (active LOW enabled) If CTS is HIGH, data will NOT be sent out the UART, and further configuration in command mode will be problematic as no response will be received.

11. Reset to default: Restoring Factory Default configuration settings:

11.1 From command interface use the factory RESET command to restore the defaults. This command automatically loads default settings, and executes a “save” command. You then need to issue the reboot command so that the module reboots with the default configurations.

11.2 Hardware reset to factory default value: Power off → press the “Reset” button → power on and toggle another 4 times by clip or pin on the top of the adapter. “Reset” is sampled at about 1 Hz, please make sure that transitions (H to L or L to H) are at least 1 second long. The terminal will display “PIO9=1~5”.

```
MAC Addr=00:06:66:51:d3:ff
*READY*
AP mode as WiFly-EZX-ff on chan 1
Listen on 2000
DCHP Server Init
PIN9=1
DHCP: 1.2.3.14 lease to *
PIN9=2
PIN9=3
PIN9=4
PIN9=5
Factory-reset
```

12. Utility Software

- TeraTerm: terminal emulator, 3rd party software (http://ttssh2.sourceforge.jp)
- PortPeeker: packet sniffer (http://www.rovingnetworks.com/resources/show)
- Virtual COM port emulator: 3rd party software. Not include in the package. (http://www.eterlogic.com/Products.VSPE.html)

13. Default value: version 4.00 firmware (“$$$” and “get everything” are the command on the first 2 lines)

```
$$$
<4.00> get everything
wifly-EZX Ver 4.00, Mar 27 2013 13:58:53 on RN-171
Beacon=102
Reboot=0
IF=DOWN
DHCP=ON
IP=0.0.0.0:2000
NM=255.255.255.0
GW=0.0.0.0
HOST=0.0.0.0:2000
PROTO=TCP,
MTU=1524
FLAGS=0x7
TCPMODE=0x0
BACKUP=0.0.0.0
OPEN=*OPEN*
CLOSE=*CLOS*
REMOTE=*HELLO*
FlushSize=1420
MatchChar=0
FlushTimer=5
IdleTimer=0
CmdChar=$
DNS=0.0.0.0
Name=dns1
Backup=rn.microchip.com
Lease=86400
FTP=0.0.0.0:21
File=wifly-EZX.img
User=roving
Pass=Pass123
Dir=public
Timeout=200
FTP_mode=0x0
SSID=roving1
Chan=0
ExtAnt=0
Join=0
Auth=OPEN
Mask=0x1fff
Rate=12, 24 Mb
Linkmon-Infra=30
Linkmon-AP=3600
Passphrase=rubygirl
TxPower=12
EAP_Id=userid
EAP_User=peap-user
SleepTmr=0
WakeTmr=0
Trigger=0x1
Autoconn=0
IoFunc=0x0
```

IoMask=0x21f0
IoValu=0x0
DebugReg=0x0
PrintLvl=0x1
LaunchStr=web_app
TimeEna=0
TIMEADR=64.90.182.55:123
Zone=7
Baudrate=9600
Flow=0x0
Mode=0x0
Cmd_GPIO=0
JoinTmr=1000
Replace=0x24
DeviceId=WiFly-EZX
Password=
Format=0x0
Signal=0
Average=5
BCAST=255.255.255.255:55555
Interval=0x7
Backup=0.0.0.0:0
Sensor=0x0
SensePwr=0x0
<4.00>

14. Specification:

14.1 The WiFi RS-232 adapter is made by the model RN-171, please check the site for more information.
http://www.rovingnetworks.com/products/RN_171

14.2 The WA-232 model support RS-232 interface only. If you need the WiFi to RS-422/485 adapter, please check the model WA-422R or WA-485R products.

14.3 If you need the digital I/O or analog I/O functions, please contact us for customized design.

Remark:

1. Please visit the site to download all the documents and software of the model RN-171.
http://www.rovingnetworks.com/resources/show
2. All the copyright of the RN-171 resources are belonging to Roving Networks Inc.
3. All contents are subject to change without prior notice.