LPRS

eRIC HackSheet
How to Hook Up eRIC Modules

Please read this in conjunction with the eRIC and the eRIC Breakout Board datasheets.
Break Out Board design is 'Open Hardware' designed and published by:
Rick Winscott – www.quilix.com
See: https://github.com/rwinscot/eRIC-breakout

Connect to PC

19200 Baud (Default) 1 Start, 8 data, 1 Stop Bits

USB to RS232 Convertor If required

The host data rate, RF Power output and frequency can be configured using the 'easy Radio Companion' software.

RS2322 to Logic Level Shifter Inverters e.g. Max232 N.B. Module requires 'inverted' data.

Diagnostic LEDs – useful but not essential

Unregulated Input

Output

LDO Regulator

Gnd

'Clean' noise free <25mV DC supply. +3.3V typical

Receive – 15mA Transmit – 32mA

+3.3V

Handshaking not Used ? Tie 'Host Ready' Input to 0V 'Busy' Output - No Connect

RS232 Serial Input/Output

Input protection resistor (say 1K) as module operates internally at 3.3V

0V

Decouple supply pin close to pins

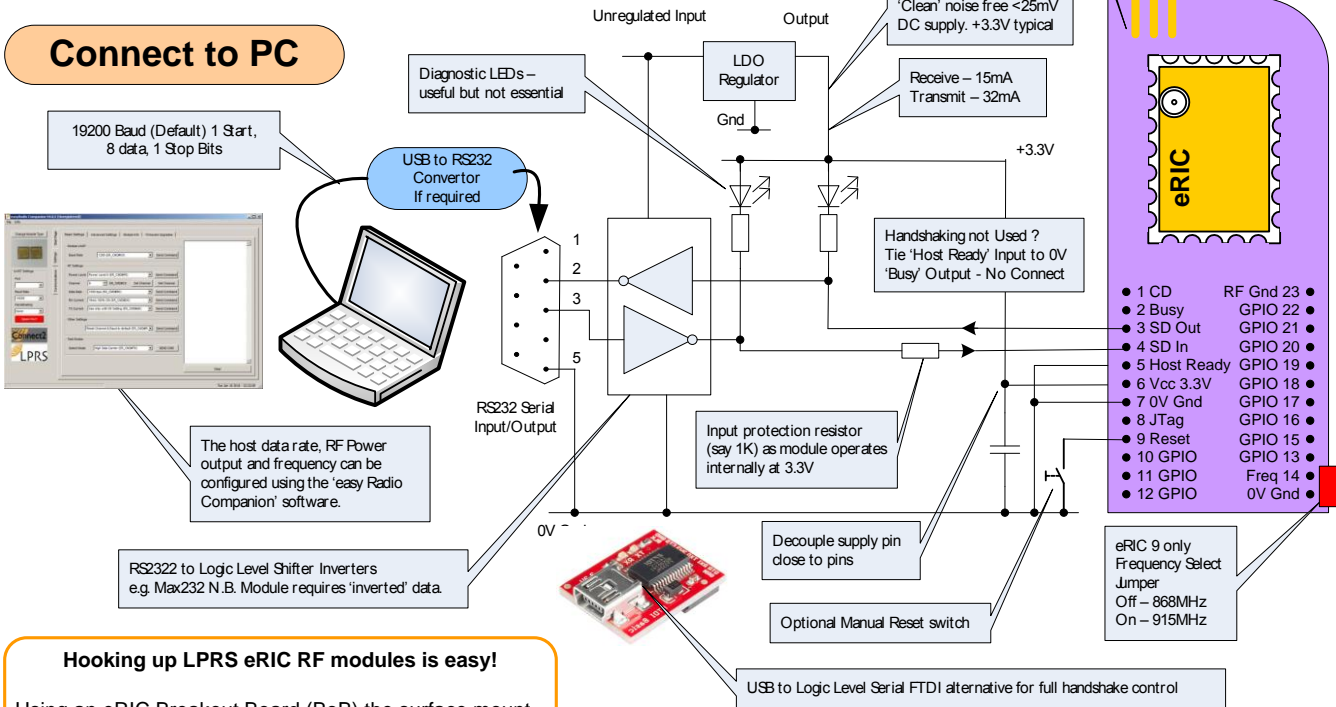Optional Manual Reset switch

USB to Logic Level Serial FTDI alternative for full handshake control

¼ Wave Whip Antenna 16.4 cms for 433 MHz 8.2 cm for 868/915 MHz A length of solid copper wire will work OK!

eRIC Breakout Board - BoB 0.1" pitch connections for easy breadboard development

eRIC

- 1 CD · · RF Gnd 23
- 2 Busy · · GPIO 22
- 3 SD Out · · GPIO 21
- 4 SD In · · GPIO 20
- 5 Host Ready · · GPIO 19
- 6 Vcc 3.3V · · GPIO 18
- 7 0V Gnd · · GPIO 17
- 8 JTag · · GPIO 16
- 9 Reset · · GPIO 15
- 10 GPIO · · GPIO 13
- 11 GPIO · · Freq 14
- 12 GPIO · · 0V Gnd

eRIC 9 only Frequency Select Jumper Off – 868MHz On – 915MHz

Hooking up LPRS eRIC RF modules is easy!

Using an eRIC Breakout Board (BoB) the surface mount castellated eRIC connections are brought out to more convenient 0.1" pitch pins that can be plugged into any prototyping breadboard.

Power and logic level serial input and serial output are the minimal connections required. Serial data is 'inverted' allowing direct connection to uController UARTs or connection to PC serial ports via level shifter/inverters.

A USB to logic level converter (Arduino FTDI Basic or Friend or similar) can alternatively be used if full 'handshaking' is required. Use of handshake (flow control) is optional but should be used for highest data throughput.

eRIC operates on a 3.3V supply. Take care not to damage inputs when connecting to any 5V powered devices by fitting 1k resistors in series with the signal lines as shown in the diagrams. eRIC outputs should be able to drive 5V logic level inputs or loads sinking or sourcing no more than 10mA such as LEDs etc. The power supply should be locally decoupled and capable of continuously supplying the peak transmit current.

Low power modes are set using serial commands detailed in the eRIC data sheet.

Between 1 and 250 bytes of data can be sent in one transmission which automatically begins when the buffer is full or when 'no data' is detected for twice the character time. Over air data rate is 38400 bps. Host data rate can be set between 2400 and 115200 Baud (19,200 default).

A ¼ wave whip antenna can be connected directly to the on board SMA RF connector or via a flexible 50R cable to the eRIC UFL connector.

Connect to uController

External whip antenna 433MHz, 868/915MHz

Conducting Ground plane e.g. Metal case or PCB area. Important - the antenna works 'against' this ground plane

BoB Size 67 x 20 x 5mm Pin pitch = 0.1"

Optional UFL RF connector

Digital Carrier Detect Output: High - Indicates received in-band signal Low - Idle - no signal

+5V

Host uController: E.g. Microchip Atmel Arduino PicAxe Raspberry Pi Beaglebone

+3.3V

UART

GPIO

0V Gnd

eRIC

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- 10 GPIO · · GPIO 13
- 11 GPIO · · Freq 14
- 12 GPIO · · 0V Gnd

Host Ready Input: Low - Host Ready to receive data from eRIC High - Host Not Ready to receive data

Busy Output: Low - eRIC Ready to receive data from Host High - eRIC Not Ready to receive data

GPIO via 1k series resistors if 5V outputs

For Technical Support see: www.lprs.co.uk/resource-centre/support/