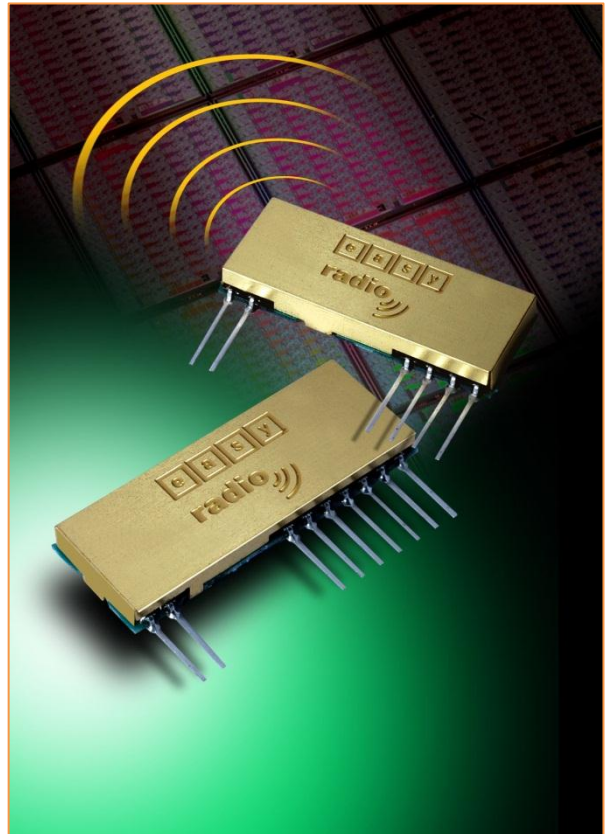# easyRadio Advanced RF Modules

QUICK START GUIDE

Introduction

The purpose of this document is to familiarise you with the features and usage of easyRadio modules, particularly with respect to the latest range of modules from LPRS, easyRadio Advanced（eRA）

Key points:

- o What is easyRadio Advanced and how it can significantly reduce your design time.

- o New Advanced Features

- o Physical Connections

- o Setting up ER Companion

- o Understanding the easyRadio Command Structure.

o   easyRadio Tools: Using and Setting Up the easyRadio Companion（Working with the adjustable parameters）

What is easyRadio Advanced and how can it significantly reduce your design time

Our latest release of easyRadio solutions, the "Advanced" range, continues on from the success of the very popular 02 series. Incorporating our unique easyRadio software protocol we extend further on the simplicity of previous versions making it even faster to implement. With the RF communication software in place, all you need to concentrate on is completing the finished product.

Enhanced Features of the easyRadio Advanced Range.

More Channels

- Up to 132 Channels

- Temporary Channel switching.（Saves EEPROM over time）

- Compatible with all ISM 402-470 / 802-940MHz RAW data transceivers. AM/FM（GFSK）

- Full channel separation

Multi-bandwidth

- A World first. Users can select from 12.5KHz to 150KHz channel spacing.

Fully flash upgradeable

- Must use ER Companion Software

- Firmware files downloaded via internet or embedded in latest ER Companion Software

Digital RSSI:

- Live RSSI

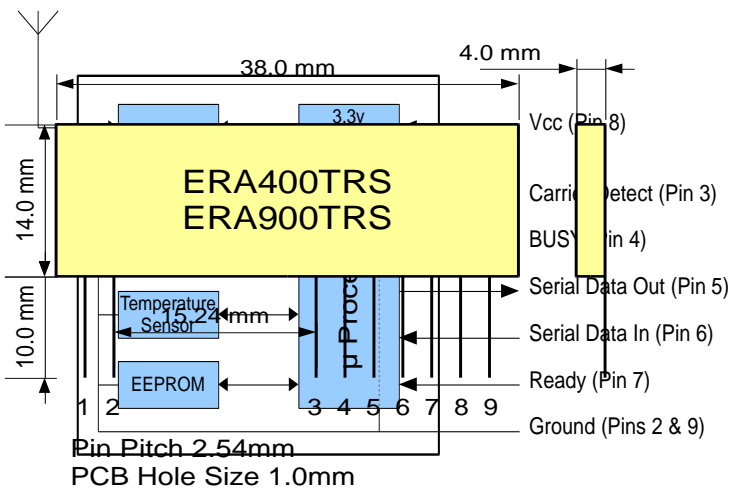- Last Packet RSSI

- RSSI delivered in packet

Carrier Detect
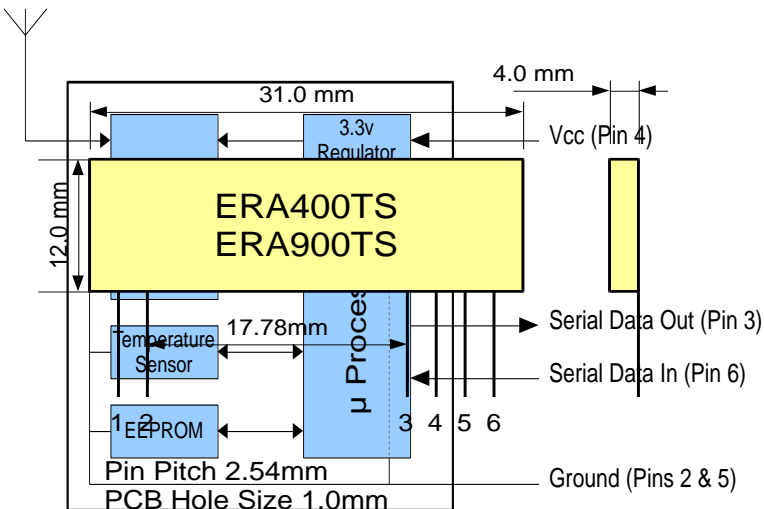
- Replaces analogue RSSI pin

Temperature Sensor:

- Automatic frequency adjustment (Important on narrow channel spacing)

- TempeRAture of module can be read via a command

Physical Connections


```
        38.0 mm              4.0 mm
                    3.3v
                                    Vcc (Pin 8)
  ERA400TRS
  ERA900TRS                         Carrier Detect (Pin 3)
14.0 mm
                                    BUSY (Pin 4)
                                    Serial Data Out (Pin 5)
  Temperature     15.24mm          Serial Data In (Pin 6)
  Sensor
10.0 mm                             Ready (Pin 7)
  EEPROM
  1   2          3  4  5  6  7  8  9  Ground (Pins 2 & 9)
Pin Pitch 2.54mm
PCB Hole Size 1.0mm
```

Setting up

ER Companion:


```
        31.0 mm              4.0 mm
                    3.3v
                    Regulator       Vcc (Pin 4)
  ERA400TS
  ERA900TS
12.0 mm
                    17.78mm         Serial Data Out (Pin 3)
  Temperature
  Sensor                            Serial Data In (Pin 6)
  1  2          3  4  5  6
  EEPROM
Pin Pitch 2.54mm                    Ground (Pins 2 & 5)
PCB Hole Size 1.0mm
```
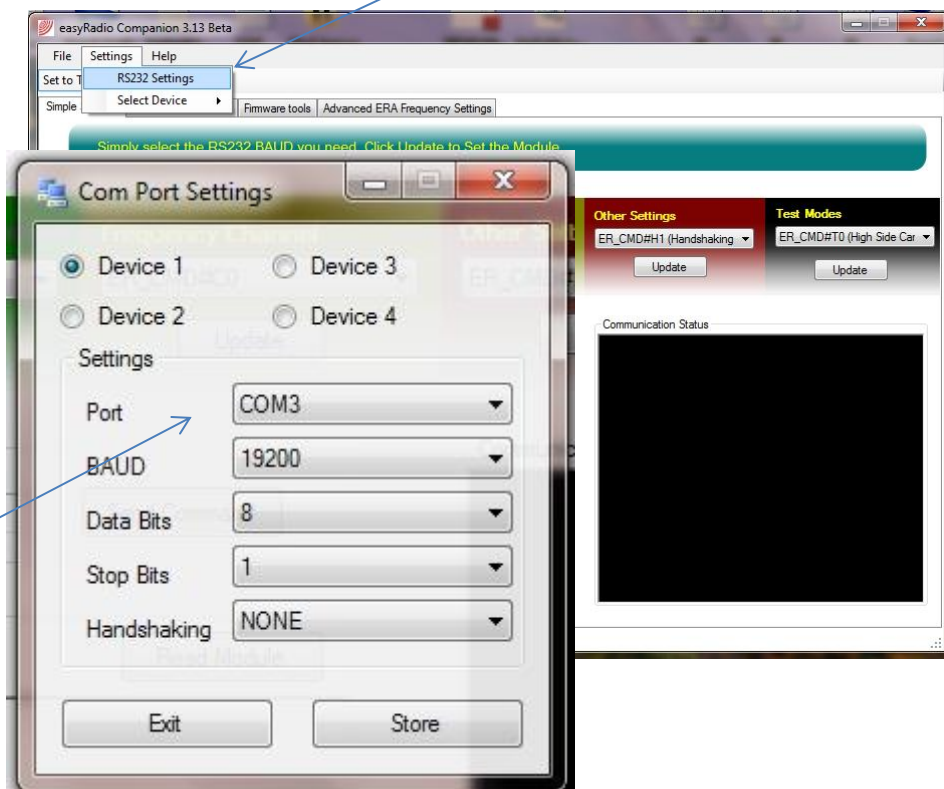

For USB driver installation you can use.

Various Windows Operating Systems including:-
Windows XP/Vista/7

.net framework will be required to run easyRadio software in Microsoft Windows OS

Download ER Companion Setup http://www.lprs.co.uk/easyradio.html

Install the software:

Setting the Serial Ports:
Settings>RS232 Settings

CLICK SETTINGS

Other Modes below（see full operation guide）:

RAW Data Mode

FM ／ AM

Refer to Pendant Data Sheet for:-

easyRadio Pendant modes and UART Mode

Basic Command Structure:

1）Host sends command to the module via the UART interface.

2）easyRadio modules echo with the same command so the host can verify the instruction is correct.

3）Host sends an 'ACK' string in ASCII. (Actual string of 3 bytes – "ACK")

All commands are ASCII.

All commands that alter settings are sent to the module in a specific sequence. .i.e. **ER_CMD#C**1

ER_CMD#	=	All commands start with this string
C	=	Function being set/read
1	=	Value being set

Refer to the current operation guide for all commands.
Basic Command Functions:

U	=	Modify/Read UART Setting
C	=	Modify/Read Channel Setting
P	=	Modify/Read Power Setting
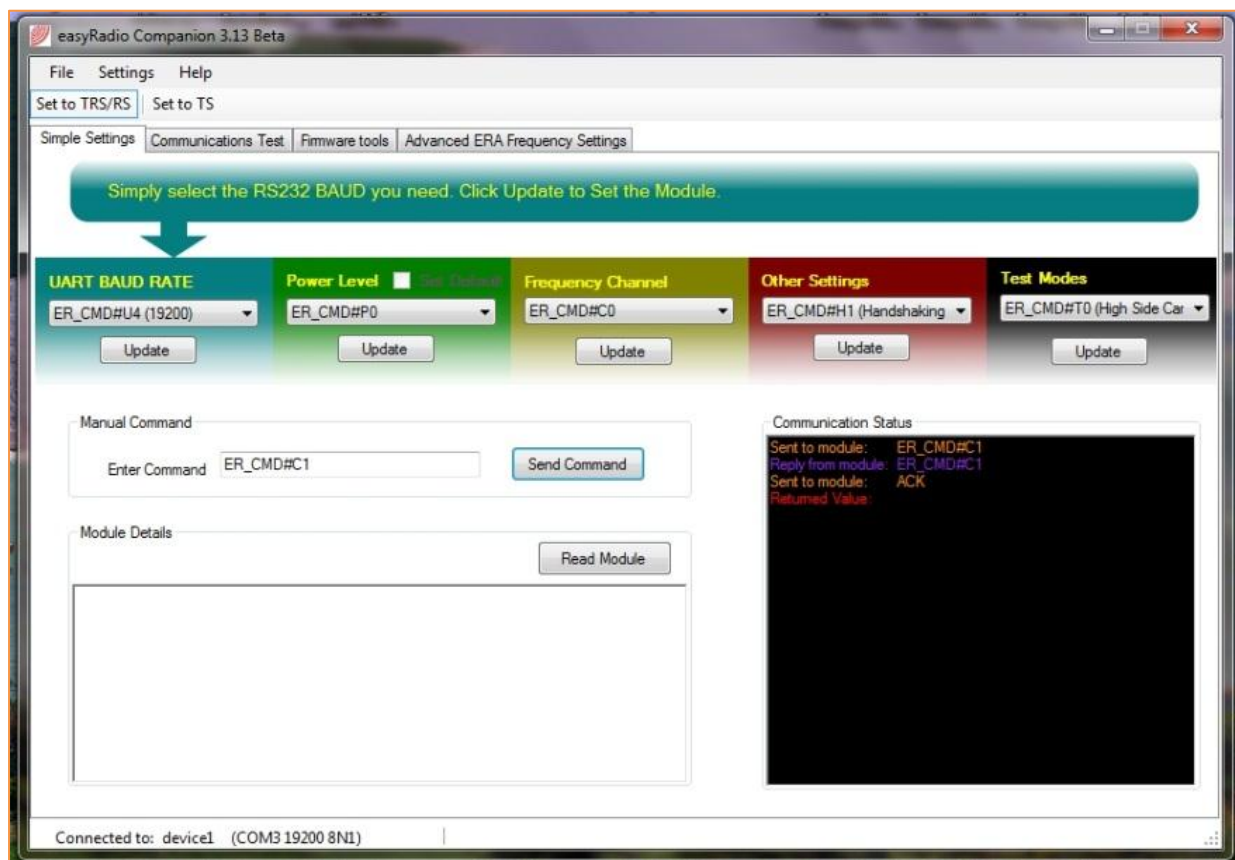
Main easyRadio companion screen showing

ER_CMD#C1command

easyRadio Tools: Using easyRadio Companion 3.xx

Using Tabs

Simple Settings Tab

UART BAUD RATE
Power Level
Frequency Channel
Other Settings
Simple Settings Tab
Test Modes

Manual Command Box
Enter commands not in the lists.
Module Details Box
Module firmware
Manufacture date
Manual Command Box
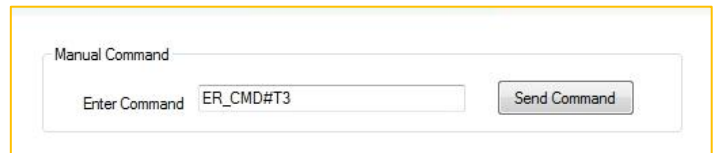
eRA Commands
c   =   temporarily modify channel setting (does not store in EEPROM, and will reset on POR)

BANDWITH (B) AND BANDPLAN (b) SETTINGS

B = MODIFY /READ BANDWITH SETTING		b = Modify/Read Band Plan Settings		
B0	12.5KHz	b0	433.1MHz	869.7MHz
B1	25KHz	b1	433.1125MHz	902MHz
B2	50KHz	b2	458.5125MHz	863MHz
B3	100KHz	b3	433.00MHz	User ?
B4	Reserved	b4	User	User
B5	Reserved	b5	User	User
B6	Back Compatible Mode	b6	User	User

Def. band plan.
Generally we would refer to a band plan as being the start and finish frequencies which are designated for use for example the EU designated frequencies.
As eRA series modules use channel numbers, the band-plan refers to the lowest frequency edge that is adjacent to Channel 0.

For example: Band-plan 0 (default) on ERA400TRS is 433.1MHz.

Therefore Channel 0 (C0) would have a centre frequency of half the current bandwidth +433.1MHz.

So in the case of the default bandwidth (B3 = 100KHz):
F (centre) of C0 = 433100000Hz + 50000Hz = 433150000Hz or 433.15MHz
C1 = C0 + 100 KHz = 433.25 MHz

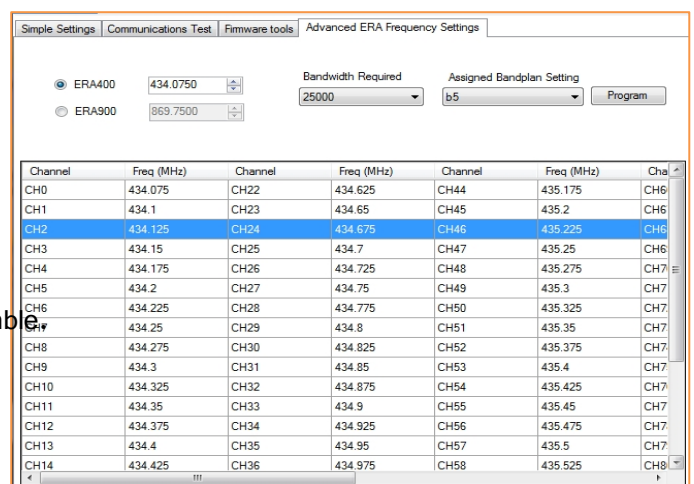On eRA series, there are 7 band-plan settings available (b0-b6).
b4 to b6 can be set by the user using the Advanced eRA frequency settings Tab

Communications Test Tab – Sending text data

Firmware tools Tab – To update to latest firmware.

Advanced eRA frequency settings Tab

Shows frequency, bandwidth and band plan table.

For full technical details please download the easyRadio Advanced operation guide here:-

http://www.lprs.co.uk/easyradio.html

Advanced ERA Frequency Settings Tab

Copyright

Disclaimer

easyRadio modules are a component part of an end system product and should be treated as such. Testing to

fitness is the sole responsibility of the manufacturer of the device into which easyRadio products are fitted, as is also the deployment into the field.

Any liability from defect or malfunction is limited to the replacement of product ONLY, and does not include labour or other incurred corrective expenses.

Contact Information:

Please Contact:- **Low Power Radio Solutions Ltd**

Two Rivers Industrial Estate

Station Lane

Witney

Oxfordshire

OX28 4BH

Tel: 01993 709418   Fax: 01993 708575

Website www.lprs.o.uk   email info@lprs.co.uk