### USB RDS ENCODER USER MANUAL QUICK START & USER GUIDE





Enigma Broadcast





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Congratulations on your purchase of the **Enigma USB RDS encoder** for FM broadcast applications. Once programmed this standalone unit offers a fully functional RDS encoder in single unit at a fraction of the cost of units of comparable quality. The unit is fully compatible with stereo broadcasts and conforms to all international RDS standards and directives (see 'Technical Specifications' - Section 5.0).

This document is designed as a guide to the various functions of the **Enigma USB RDS encoder** for a more complete understanding of the RDS standard itself please consult more complete documentation available elsewhere online.

Please read this guide carefully: Once your encoder is correctly set up it should give you years of trouble free operation. Please retain this manual for future reference. Any questions or comments please do not hesitate to contact us through our website: enigma-shop.com

#### **Specifications**

(Also see 'Technical Specifications' at end of document)

#### **Functions:**

- Full RDS encoding
- Programming via USB
- Stereo Compatible

#### Power:

- DC 9-16vDC regulated @ 100mA (not included)
- Reverse Polarity Protection
- DC power LED indicator

#### Connections:

- Dual RCA phono
- (Audio in/Audio + RDS out)
- DC power connector
- Type A USB socket
- Traffic Announcement
- Pilot Sync

#### Additional Requirements:

- Windows 2000, XP, Vista or 7 with free USB port
- Type B to type A USB lead (included)
- External power source (see above)





#### Section 1.0 - Enigma USB RDS encoder Set-up Guide

#### **Getting started:**

The following is intended as a brief introduction to familiarise yourself with your new encoder and for you to see how text can be displayed on a receiver. It will also reassure you that your have everything correctly set up.

#### What you will need:

- Power supply 12-15VDC min 100mA
- A small transmitting device (e.g. FM exciter)
- Dummyload and/or appropriate RF shielding (where required)
- A small screwdriver
- A lead to connect your audio source (terminated one end with RCA phono connector)
- A lead to connect to your transmitting device audio input (terminated one end with RCA phono connector)
- An FM receiver capable of decoding and displaying RDS information

We are going to use an FM exciter and dummyload to quickly see the functionality of the **Enigma USB RDS encoder**.

**NOTE:** It is your responsibility to ensure that any broadcast equipment you use complies with local laws in your geographical location, Enigma Broadcast does not encourage or condone the breaking of any laws and will not be held liable for any outcome, injury or damage which arises from doing so.

Connect your encoder as shown in the image below:







At this point the other end of your USB cable shouldn't be connected to anything (DO NOT CONNECT TO PC AT THIS POINT: If you want to program your encoder straight away jump to section 1).

The input should be connected to a line level audio source. The output should be connected to your transmitting device:



Note: Professional FM

exciters may have a separate input for RDS/SCA, in which case the passive/active mixer is incorporated into the circuit and you should connected your encoder there (no external mixing is required).

The image above shows two ways of connecting your encoder to your transmitting device:

- 1. The encoder can be use 'inline' with the audio: This is the simplest way and the way in which the connection is made throughout this manual.
- 2. You can use an active or passive mixer (e.g. RC mixer/Op Amp mixer) and mix the audio/RDS at the transmitting devices input (or connect directly to RDS input on exciter where available)





Start with your transmitting device set for correct deviation/modulation (correct volume).

Once you are happy you have connected your encoder correctly you are ready to apply DC power (see 'Technical Specifications' for power supply requirements).

With power applied you should see two LEDs illuminate on the PCB: The power LED should be constantly lit, the 'RDS' LED should flash at a rate of about 1 flash per second (when connecting the USB lead/communicating with the device you will also see the T/X and/or the R/X LEDs illuminate/flash).

Keep your transmitting device and your RDS encoder separated by some distance and apply power to your transmitting device.

Turn on your radio receiver and tune to the same frequency as your transmitting device. With RDS turned on you should see the RDS indicator (if your receiver has one) illuminate and a scrolling message should appear reading:

'ENIGMA BROADCAST USB SCROLLING RDS ENCODER TEST OK' (See image overleaf).

You should now be able to apply audio and adjust the level for correct modulation. You should now be listening to your broadcast and the RDS message should continue to scroll. To correctly configure your **Enigma USB RDS encoder** follow the installation steps outlined below:

#### Suggested installation steps:

To successfully set up and use your RDS encoder we suggest you following the following steps in order:

- Plug Enigma USB RDS encoder in to PC USB and wait for 'found new hardware wizard'
- Unplug encoder
- Install TinyRDS
- Apply DC power to encoder
- Plug back in to USB
- Run TinyRDS
- See section 4.6 for configuring port settings
- See section 4 for general use of RDS software
- See section 3 for Enigma USB RDS encoder functions/use

The information to complete each of the steps is contained in the following sections of this guide.

**NOTE 1:** A highly recommended first step once you connect your encoder to your PC is to 'READ' the information/current settings in the device to your PC as this will give you a good example of one way to configure your device.





RDS indicator: The receiver has correctly recognised that there is RDS information contained in the current broadcast.

'ENIGMA' is currently set as the 'Default PS' and the rest of the message is set as 'Dynamic PS'



Congratulations, you have successfully tested your encoder, it is now ready for use: Please read the rest of this manual for more details on implementing RDS in your own system.



**NOTE 2:** *Images are for illustrative purposes only; your receiver may display information differently/have different functions.* 





#### Section 2.0 – Software Download:

The **Enigma USB RDS encoder** is (in the vast majority of cases) a '**Plug and Play**' device, meaning that all you need do is plug it into your PC for it to work. To program your RDS encoder with all the information you wish to broadcast you will need our control software which is available for free download from the 'USB RDS Encoder' area of our website. Once you have downloaded the software please follow our step by step installation guide:

**NOTE 3:** All installation steps have been carried out on a Windows XP operating system using Google Chrome web browser. If you require further assistance with other versions of Windows installations please consult the help files supplied with your operating system.

#### Section 2.1 – Installing 'Tiny RDS'



#### Enigma Component Shop USB RDS Page

Step1: Select the RDS software from our download page.



Setp2: Double-click the .exe file to begin automatically installing software.







**Step 3:** Click 'Run' to continue install

Step 4: On the next screen select 'Next' to begin automatic install





Step 6: Select the location in which you would like install RDS program.





Setup - TinyRDS	
Select Additional Tasks Which additional tasks should be performed?	
Select the additional tasks you would like Setup to perform while in then click Next.	stalling TinyRDS,
Additional icons:	
Create a desktop icon	
Create a Quick Launch icon	
< Back Ne	ext > Cancel

Step 7: Select your preferred choices for launch icons

Click in either of the tick boxes next to the two options to install either a quick launch icon and/or a desktop icon. Both of these will make launching the program a lot simpler and quicker



Step 8: Check you have selected all the options you would like and click 'Install'





The RDS software should now be installed on you computer and ready for use programming the RDS encoder with all the information you wish to broadcast as part of your FM signal. You can launch the software from a number of locations which makes it much simpler to use.



Step 9: Desktop and start menu locations

**NOTE 4:** <u>THE</u> Enigma USB RDS encoder <u>DOES NOT POWER VIA USB AND REQUIRES AN EXTERNAL</u> <u>POWER SOURCE</u> (see 'Technical Specifications' at rear of document for precise requirements).

If you have any issues with plug & play compatibility of the device, or for manual driver installation see the 'Notes' section at the end of this document.





#### Section 3.0 – Using Your Enigma USB RDS encoder

An example of the **Enigma USB RDS encoder** is pictured below. Each of the important elements has been lettered and a brief description is given in the table overleaf.

An example application is described in Section 5.







Drawing Number	Name &
	Functional Description
Α	Input/Output (marked on PCB) – See 'specifications' for technical characteristics
В	USB Connection – Connect to PC using cable provided
C	Power Supply – Connect DC supply (see specification) observing polarity
D	RDS Level Adjustment – Used to set correct modulation
*E	Pilot Sync Enable – See next section
*F	Pilot Tone Input – See next section
*G	Traffic Announcement – Use external switch for manual traffic announcements
Н	Mounting holes (x4) – Use M3 machine screws for secure into enclosure
J	Power Indicator – Illuminates when DC power applied
K	RDS Indicator – Flashes during normal use
L	USB Transmit/Receive Indicators - Indicate the transfer of data to/from PC

\* Each of these pin headers are orientated the same: With the encoder facing you (as shown in the image above) the signal pins are the upper pin of each connector (furthest pin from you) and are aligned with the 'J1,J2,J3' markers on the PCB legend.

#### Section 3.1 – Connections (A,B and C)

Audio input and RDS/RDS + Audio output is via two RCA phono connectors, input and output connections are denoted on the PCB legend.

If broadcasting in mono mixing of the left and right channels must be done prior to the RDS encoder input (if using encoder 'inline' with the audio source). A simple resistive mixer will do so long as it provides the correct level of audio to the device.

Alternatively many professional exciters have separate RDS/SCA inputs and the output from the encoder should be connected directly to this.

**NOTE 11:** All audio processing (limiting, EQing, and stereo encoding) MUST be carried out earlier in the audio chain (i.e. the RDS encoder should be the last device in the chain before the transmitter/STL).

Power connection is screw terminals meaning that you need to have either bare wire or ferrule connections on your power source. Connect the power supply and tighten the screws.

**NOTE 12:** Carefully observe polarity when connecting power supply (the encoder does contain reverse polarity protection, but it would be preferable to never use it!) – For full power supply requirements see 'Technical Specifications' at the rear of the document

USB connection – connect to PC using cable provided. To enable communications the **Enigma USB RDS encoder** must be powered via an external DC power supply.





#### Section 3.2 – Pin Headers (E,F and G)

The pin headers (along the edge of the PCB; bottom pin = GND) are used to control various functions manually and will require some basic electronics knowledge (including the ability to solder) to implement them:

FUNCTION	DESCRIPTION
P_EN (pilot enable)	By fitting the jumper provided you can sync the RDS encoder to the pilot tone from your stereo encoder (for mono transmission DO NOT fit the jumper) – see sectionXXX.
P_IN (pilot input)	This is the input for the pilot tone form the stereo encoder. The tone must fulfil some basic technical requirements (for full details see the 'Technical Specifications' at end of the document.
ТА	Traffic announcement: By connecting a switch between the two pins you can send a logic low signal to the main RDS chip telling it you are making a traffic announcement. This function should only be used for real traffic announcements by stations fully licensed to make them, otherwise DO NOT CONNECT

#### Section 3.3 – Miscellaneous Functions (D,H,J,K and L)

Items J,K and L in the image overleaf are various indicator LEDs. One shows the correct connection of DC power, the other (flashing) shows normal operation of the RDS encoder chip itself and the other two indicate when communication between the encoder and the PC is taking place (one for transmit and one for receive).

The items labelled H are mounting holes: The PCB should be mounted in a case, preferably using standoffs (spacers) and M3 machine screws. The boards should be installed as far away as possible from sources of interference (e.g. mains transformers, RF power amplifiers etc), and appropriate screening should be used where this is not possible (e.g. when installing into the same housing as a transmitter).

Item D is a potentiometer (a device with variable resistance) which is used to adjust the level of the RDS signal. This should be adjusted using a broadcast analyser for the correct level of modulation, alternatively and oscilloscope could be used, or even a DVM. If you do not have any of these available to you then you will have to carefully adjust manually: Adjust everything else (audio, limiter, stereo encoder, exciter) etc. to the level at which you will use them. Apply the loudest signal the system is likely to receive (at peaks of music). Starting with the RDS set to minimum (no RDS) adjust the RDS level control SLOWLY while watching an FM receiver with RDS display. Once you see the RDS test appear stop adjusting at that point. Further experimentation may be required to ensure RDS can be received on most RDS enabled receivers (e.g. car radios etc.) – further adjustment may be necessary. THIS METHOD IS NOT RECOMMENDED!





#### Section 3.4 – Syncing Pilot Tone

The RDS carrier can be phase-locked to the 19kHz stereo pilot signal: The unit will not automatically sense a stereo pilot and lock to it, you need to provide a 19KHz tone/ square at the P.IN pin using the following method:

Fit jumper provided to the P.EN pin header. If used permanently with a stereo encoder leave the jumper in place.

Apply the 19KHz pilot tone signal from your stereo encoder signal to the P.IN connector (consult the user manual, schematic or contact the manufacturer if unsure where this is on your stereo encoder). The minimum pilot level required is 250mv pk-pk and the maximum is 5v, it can be either a sine or square wave).

When this mode is enabled, use the software to set the Auto (stereo) mode and the phase-shift (located in the 'System' tab). Normally the phase shift would be set to around 90 degrees.





#### Section 4.0 – Introduction to RDS Software

By now you should have downloaded and installed your new RDS software (section 1.1) and have it ready to use on your PC. In the next section we will introduce you to your RDS encoder and show you how to connect it and use the software to control it. For now let's familiarise ourselves with the software itself and its functionalities (you can view changes you make by leaving the encoder connected as shown in Section 1 and viewing your changes on the receiver display).

## **NOTE 5:** The software you should have already installed can be used to control several different variants of RDS encoders, therefore there may be parts of the program which do not apply to the **Enigma USB RDS** encoder; these will be denoted by the initials **N/A** (not applicable).



#### Section 4.1 – Program Tab

Open your RDS software and click the 'Program' tab at the top left of the screen, familiarise yourself with its layout. This is where most of the 'fixed' or 'static' information about the broadcast is entered and edited, for example the name of the station. See the list of functions in the table below:





FUNCTION	DESCRIPTION	
	This is your station na	ame; it can be up to 8
	characters long (including	g spaces). This is often the
Default PS	only information to be dis	played on a receiver. If you
	chose to display other inf	ormation the encoder will
	return to the default PS a	at the end of each display
		op
	This is a unique identifyin	g number (in hexadecimal
	(first 2 digits are goograp	bical ID, the last 2 unique
PI	(first 2 digits are geographical ID, the last 2 unique	
	station when using other functions such as	
	alternative frequencies and traffic announcements	
	Select from the drop-down	n list the option which best
	describes yours stations'	current content. You can
Program Type & Music/Speech	also select a music/spee	ch option depending on
	whether your program	contains mostly music,
	speech, or a	mix of both.
	This is a list of frequenci	es used to broadcast the
	same content (or complimentary content) in	
	different geographical le	ocations. Can be used to
Alternative Frequencies	automatically tune the receiver (e.g. the BBC in the	
	UK set up a national network of frequencies using	
	frequency from	the drop down
	Used to help receivers de	code the RDS information
Decoder Identification	by telling them what else is being broadcast – e.g. a	
	stereo signal, compressed audio etc	
	These are all communica	ation options between the
	software and	the encoder:
		Sends data to the
	Cond	encoder (will be lost
	Sena	during power down
Send/Store/Receive/Exit		without using 'Save')
		Stores data in encoder
	Store	even during power
		down
	Receive	Read in the data stored
	Evit	Exits the program
	These settings should be i	ised with caution. They are
	for relaying up to date traffic information to	
Traffic Settings	listeners. The 'Traffic Program' setting tells the	
	receiver that you are a station that carries such	
	information. The traffic announcement option can be	
	used to control a receiver that has the TA function	
	set (upon receiving a TA command a receiver will	
	tune from the current program's frequency to the	
	frequency of the station carrying the traffic	
	announcement). A station must be licensed to carry	
	this service in most countries.	

**NOTE 6:** The Send/Receive/Store functions apply to every tab: <u>ANY change must be 'sent' to the device</u>, once sent any change you would like to keep needs to be 'stored' before removing power and 'reading' in any data form the device will overwrite any changes you made in the software which were not 'sent' to the device.







#### Section 4.2 – Dynamic Program Settings (PS) Tab

The next tab 'Dynamic PS' is where you can control information about your broadcast which is likely to change, for example the name of the current show on air. This text will be seen as short, individual messages, or as 'scrolling' text.

# **NOTE 7:** You must exercise caution when using scrolling, or to a lesser extent dynamic RDS: Many countries have implemented laws regarding the use of dynamic RDS and the distraction it can be to drivers. Please check your local laws before proceeding to use this feature.

RDS is limited to a total of 8 characters being displayed at any single moment. By using the Dynamic PS you can take advantage of some excellent features of the **Enigma USB RDS encoder** and display much longer messages (up to 72 characters) in block of 8.

The different modes of operation fall into two main categories:

- 1. Display information one 8 letter (or less) word at a time
- 2. Displaying the words as a string where the next letter appearing on the left of the display replaces the last letter on the right of the display as it 'disappears' form the screen

The most basic (and therefore reliable) mode of operation is **Mode 0 Fixed 8 Characters**: In this mode each 8 character block is broadcast as a separate piece of information (which means that in areas of weak reception receivers are likely to only miss a single word and will be able to pick the message up form the next word rather than having to wait until the start of the next loop).

After selecting this mode you can enter each word you would like to display, in order, in the boxes on the left of the screen. This mode is one of the most reliable, so try this mode if you have any issues when using modes 1-3.





**Mode 1, Scrolling Text:** The message to be displayed is entered in the box at the bottom of the screen. The RDS receiver will then display the message in its entirety by scrolling the message 8 characters at a time from the left to the right hand side of the display.

**Mode 2 Word Alignment:** Similar in operation to mode 0, except that test is encoded and broadcast as a message from the bottom text box, and the test is displayed in 8 character segments.

<u>Mode 3 Space Separated Scrolling Text:</u> In this mode the text is scrolled in much the same way as it is in mode 1, except that each word (before a space) is scrolled individually, rather than as a string of words.

Modes 0 & 2 have the advantage of being more reliable, but suffer from having to fit your message into 8 character blocks.

Modes 1&3 have the advantage of not placing word size limits upon the user, but suffer to a much greater degree from reduced signal strength (poor reception).

The best method is to experiment and see which mode is most suited to your own application.

**Label Period/Delay between loops:** These functions are used to control the way the information is displayed and should be carefully configured to best performance: Adjusting the 'Label Period' will change how long each of your 'blocks' of 8 characters is displayed for, the 'Delay Between Text Loops' controls how long the 'Default PS' (see section 2.1) is displayed before beginning the loop again. For example setting the period to 5 seconds and the delay to 25 seconds will result in the Default PS (station name) being displayed at the start of the loop for 25 seconds, then each of your 8 character blocks are displayed in order for 5 seconds each, then the display will revert to the Default PS beginning the loop again.

The settings are adjusted either up or down by clicking the up/down facing arrow next to the box, or by clicking the large arrow/line icon and using the slide bar which appears (click and slide you mouse left/right to adjust the time).

**NOTE 8:** *Remember, all changes must be 'sent' and 'stored' in the device (see note 4)* 





#### Section 4.3 – Radiotext Tab

The next tab is controls the radio text setting of the device: Radiotext is a supplementary function contained within the RDS protocol (i.e. not all RDS enabled devices are capable of displaying Radiotext). It contains further information about the current song/show, or the station, up and coming events or even for corporate advertising. Unlike the other RDS information which is displayed by default Radiotext requires that the receiver is set to receive and display radio text. On some receivers Radiotext is displayed as a separate line on the display, scrolling on a loop, other receivers alternate between displaying Radiotext and the Default/Dynamic PS (this is worth remembering when deciding if you would like to use the Radiotext function: On some receivers it *may*, at times, 'overwrite' the information you are trying to display as part of you main text loop, depending on the setting on the receiver).







#### Section 4.4 – System Tab

The system tab controls settings central to the way in which your **Enigma USB RDS encoder** works, and the way it interfaces with other devices, such as stereo encoders.



**NOTE 9:** If broadcasting in mono leave clock source set to internal (PLL lock and Phase Shift remain 'greyed out'). For full instructions on syncing your RDS encoder and stereo encoder see section 3.





#### Section 4.5 – Text Sources Tab

Text sources are a way of storing information to be encoder and broadcast using your **Enigma USB RDS encoder** external to the TinyRDS program itself (e.g. as a text file). The text file chosen can be displayed as either Radiotext, or Dynamic PS. Both of these (if selected) will override the information entered previously in the corresponding tabs.

The most widely compatible file format would be a simple text file with words separated by spaces and sentences etc. separated by carriage returns.

The best way to find out which mode is most suited to your application is to connect the encoder and experiment with different settings until you find the configuration you are happiest with.







	Tabs for setting different text sources and changing format settings	Justification is used to align text on either the right, left or centre of the receiver's display	
	CO TinyRDS Program   Dynamic PS   Radiotext   System   Text Sources	Hardware   Preferences	×
	Dynamic PS Radiotext	DPS Mode D/Justification	
Various format settings. Change these to see the effect it will have on	Remove song numbering Remove expletive information in brackets	C (None) C Left	
the information dis- played by viewing the example given	Example:	Fill with Receive	
	12. Kosheen - Catch (Vocal Mix)	C Custom character:	
	Ready		

You can use this setting to fill any unused spaces between words with a custom alphanumeric character





#### Section 4.6 – Hardware Tab

The hardware tab is used to change the settings on your PC to suit the type of RDS encoder you are using, as well as the type and number port you are using to transmit data to the device.

The software should automatically recognise the encoder and port when it is connected. If it does not ensure it is powered correctly, unplug it from the PC and plug it back in again. You may then need to manually tell the software which port you are using. Once you have set up you can click 'Update' and you changes (new port opened) will be confirmed in the 'Status' window.



**NOTE 10:** To discover which port you are using when you connect the **Enigma USB RDS encoder** as you will need to locate and open your PC's 'Device Manager', the easiest way to do this is from within the RDS software itself. See steps below...





Select the port you are using for your RDS encoder and press the 'Update' button. If you do not know which port this is use the 'List...' button...



... Pressing the 'List...' button opens your device manager. By expanding the 'Ports' view you can see the COM ports currently in use. In the example below the device is connected to 'COM13'







#### Section 4.7 – Preferences Tab

These settings change the way TinyRDS looks, and the way it behaves within Windows.







#### Section 5.0 – Technical Specifications

Description	Tallated Cast Cast	
Parameter	Technical Specifications	
Dimensions	PCB measures 75 x 50 x 15mm or	
	PCB + connectors 75 x 60 x 15mm	
Supported Services	PI, PS, PTY, TP, AF, TA, DI, M/S, RT, RAW	
	(TA can be controlled manually using external switch)	
Power Requirement	12-16v DC regulated at 50mA (minimum)	
_	12-16v DC regulated at 100mA (recommended)	
	Note: Excess voltage may damage components	
RDS Output Level	Adjustable 0 to 1.2 V pp	
-	(On board adjustment: Fully clockwise is full off)	
Carrier Frequency	RDS 56kHz	
	Stereo 19kHz	
Audio Input	2V RMS, (2.8V pk-pk) Unbalanced (max)	
_	Audio Response: 20Hz – 100kHz	
	Note: All audio processing must be carried out prior to RDS encoding	
Input/Output	Input: Standard Line Level	
Impedance	Output: 500 Ω max	
Compliance	EN 50067 / EN 62106	
-	US RBDS standard	
Stereo Pilot Tone	19kHz Sine/Square wave	
	250mV(min) – 5V (max) pk-pk	
Mounting Method	4 x Grounded mounting holes	
_	Use standoffs/spacers (metal spacers will earth board to metal chassis)	
Communication	USB standard	
Protocol		





#### Section 6.0 – Example application (Case Study)

The following is a hypothetical situation, but it may hopefully give you an idea of a typical application for this device:

- Dave is the technician for 'Dance FM' a small station on mainland Spain.
- o Dance FM decide to add RDS functionality to their station.
- Dave did some online research and decided that the Enigma RDS Encoder was by far the best value for money, fully functional encoder available.
- Within days of placing his order Dave received his new encoder in the post.
- Dave took a little bit of time to download and read through the user manual for the new encoder.
- He then downloaded the TinyRDS control software and saved the installation file on his hard drive.
- He plugged in the RDS encoder to his USB port with the cable he was provided with and saw that very quickly his computer recognized the USB device and it was soon 'ready to use'.
- He then unplugged it from his PC.
- Once he was happy that the encoder would 'talk' to his PC he couldn't wait to see what else it did, so he purchased and appropriate power supply and connected it to the encoder.
- He plugged the output of the encoder to the RDS input on a professional 1 watt FM exciter he had as a spare for Dance FM.
- Then using a stereo to mono phono lead he connected the output of his DJ mixer to the input of the RDS encoder.
- Dave knew that the exciter he was using was already set up for the correct volume, so he didn't change it.
- He also knew that the exciter was tuned to 87.5MHz FM, so he tuned his FM receiver to the same frequency.
- He plugged the encoder back in to the USB on his PC and opened the TinyRDS program.
- He then switched on the RDS encoder, exciter and stereo. Straight away he saw the default 'Enigma scrolling RDS encoder Test OK' message displayed on the receiver.
- He went to the 'Hardware' tab on the TinyRDS program and pressed the 'List...' button, he found out that the encoder was connected to COM 10, so he selected this in the hardware tab and pressed 'Update'.
- He was pretty sure he'd done everything right, so he hit 'Read' and looked at both the 'Program' and 'Dynamic' tabs sure enough all the information which was displayed on the receiver was in those tabs.
- Dave now spent about 20 minutes changing the messages, switching the scrolling on and off, changing the speed of the scrolling text, and of course he sent various messages in different formats and tried the various functions of the encoder and software.
- He then changed TinyRDS to say 'Dance FM' in the program tab and set this to display for 20 seconds, he also changed the 'Dynamic' text to read 'Spain's number 1 dance music station' and set this to a display period of 4 seconds.
- He hit 'Send' and then 'Store'.
- He disconnected the encoder form the PC, powered it down and then back up and made sure that the information had been stored in the encoder, which of course it had.
- Because 'Dance FM' broadcast in mono he left the pilot sync jumper open.
- o Dave bought a small aluminum case and decided to fit the RDS encoder in to it.
- First he drilled the box with the required holes (he used the RDS encoder itself to mark the 4 mounting holes in the bottom of the box before drilling).





- He fitted two chassis mount phono sockets to the box, as well as a rocker switch, a toggle switch and a chassis mount DC jack socket (for the power supply).
- He soldered the power jack to the rocker switch, and the rocker switch to the DC input on the encoder.
- $\circ$  He soldered the toggle switch to the TA pins on the encoder.
- He soldered coaxial audio cable between the chassis mount phono connectors and the input/output pads on the encoder.
- He made sure that all the 0v connections were soldered to appropriate ground points on the PCB (in a 'star' type configuration, with the PCB as the centre).
- He used plastic spacers and M3 machine screws to mount the PCB into the box.
- He fitted the lid and took the RDS encoder to the Dance FM studio.
- He connected the RDS encoder between their graphic EQ/compressor and their STL.
- He switched it all on and checked to see his RDS message displayed on various receivers and locations throughout the Dance FM broadcast area.

**NOTE 11:** All situations/names/events are pure fictional. Any similarities to real situations/events/people/organisations is purely coincidental.





#### Section 7: Notes - Installing USB drivers (not usually required)

**NOTE 13:** The USB device used on the encoder should be a plug and play type: <u>In most situations you</u> <u>should simply be able to connect the device to your PC</u> using the USB cable provided, with DC power applied (see section 3 – Using Your Encoder) and windows should automatically detect and install the required drivers, this will happen through your 'Found New Hardware' wizard: The following steps are only necessary if this fails to work on your machine.

**THE Enigma USB RDS encoder DOES NOT POWER VIA USB AND REQUIRES AN EXTERNAL POWER SOURCE** (see 'Technical Specifications' at rear of document for precise requirements)

To use your PC to communicate with the RDS encoder through the simplicity of your computers Universal Serial Bus (USB) you will need to install drivers for the on-board USB interface device. These can be downloaded from the same location as the control software (see step 1 Section 2.1).



Step 1: Locate and double click the Drivers.zip folder







Step 2: Using your preferred (or default) zip program extract the files to a location of your choice



**Step 3:** Open the 'Drivers' folder, then the 'USB Drivers Installation Guides' folder. Locate the PDF guide for your version of Windows and follow the instructions for completing installation of drivers.

Once installation is complete you should be able to connect the RDS encoder to your PCs USB without any error messages (see Section 1 for connection instructions).

You are now ready to begin using your USB RDS encoder!

