



## Medium RDS Encoder

The Radio Data System, RDS, is intended for application to FM sound broadcasts in the FM VHF band. The RDS data signals are carried on a sub carrier which is added to a stereo or monophonic signal at the input to the VHF/FM transmitter.

The RDS encoder generates a standard RDS signal according CENELEC specifications EN50067

### Technical characteristics:

|                              |                                            |
|------------------------------|--------------------------------------------|
| RDS spectrum 50067           | : Complies with CENELEC NEN EN             |
| Sub carrier                  | : 57 KHz +- 6Hz                            |
| Modulation                   | : DSB                                      |
| Recommended FM deviation     | : +- 2 KHz                                 |
| Cross talk                   | : > 60dB                                   |
| Output level RDS             | : 0 – 500 mVpp adjustable                  |
| Output Impedance             | : 50 Ohm                                   |
| Spurious                     | : 38 KHz Typ. –80dB                        |
| Base band input              | : 10V pp max. ; a-symmetric                |
| Base band output             | : 10V pp max. ; a-symmetric                |
| Distortion                   | : < 0.1 %                                  |
| Gain RDS I/O                 | : 40 Hz tot 54 KHz +-0.1dB                 |
| Input impedance              | : 5 kOhm, parallel 47pf                    |
| Min. load MPX out            | : 600 Ohm                                  |
| Power supply                 | : 15 V DC +- 5% <100 mA                    |
| DATA I/O                     | : RS232 port 1&2                           |
| Programming                  | : DOS PC program<br>RDS.EXE en RDSsend.EXE |
| 19 KHz pilot synchronization | : external syncr. unit                     |

### RDS parameters

- **8** Programme Service banks
- **PS** (Programme Service) 62 names with programmable Times
- **PI** (Programme Identification)
- **PTY** (Programme TYPe)
- **4 x RT** (Radio Text) 256 characters
- **TP** (Traffic Programme) external switch
- **TA** (Traffic Announcement) external switch
- Stereo/Mono
- Music/Speech

### Installation:

All RDS encoders are programmed, adjusted and detailed tested at the factory. The RDS encoder can be directly connected to the transmitter input. To ensure a good RDS signal it is important to connect the RDS encoder directly to the modulator input or even better to a SCA input.

The deviation range of the FM carrier due to the unmodulated sub carrier is from  $\pm 1$  KHz to  $\pm 7.5$  KHz. The recommended best compromise is  $\pm 2$  KHz deviation

Norm signal levels, deviation 75KHz

Reference : 0 dB input signal, 500 Hz 75 KHz deviation

|               |              |                               |
|---------------|--------------|-------------------------------|
| - Right/left  | 0.5 KHz      | = - 0 dB, deviation 67.5 KHz  |
| - Pilot tone  | 19 KHz +-2Hz | = - 20 dB, deviation 6.75 KHz |
| - RDS carrier | 57 KHz +-6Hz | = - 30 dB, deviation 2.1 KHz  |

19khz -14 db onder de top van de draagolf, 57 khz -14 db onder de draaggolf van 19khz.

Dit te bekijken op een spectrumanalyzer. Dit is ongeveer goed

### Programming:

The RDS encoder is programmed by a MSDOS PC with supplied floppy containing the following files:

|             |                                                         |
|-------------|---------------------------------------------------------|
| START.BAT   | Starting RDS.exe and RDSsend.exe<br>(default comport 1) |
| RDS.EXE     | Editing text, time, etc.                                |
| RDS.CFG     | Contains all relevant RDS data                          |
| RDSsend.EXE | Ultimately programming the RDS encoder                  |

### Starting:

RDS.EXE can be easily run from the A-drive.

**RDS.EXE** knows 3 submenu's: Programme names, PTY and RT  
Choose the wanted submenu with the arrow buttons.

### Programme names and interval times:

8 Characters can be programmed in each of the 62 fields.

**TIP:** to put a text in the middle of a field start with a #. This sign will be removed automatically.

example # RDS

By holding the enter button the time-field will be selected and ready to programme time delays in the range of 1 till 99.  
To quit the submenu push the ESCAPE button.

### Programme types

Language, Area, Frequency, PTY

M/S Music/Speech

St/Mo Stereo/Mono

Quitting the submenu: ESCAPE button

### Radio Text

Selectable with switch on RDS board  
4 x 64 character text.

Warning! Confirming text with ENTER button. Closing the submenu with ESCAPE button.

### Programming RDS ENCODER:

The RDS encoder must be connected to the communication port of the PC by means of a RS232 cable (handmade?)

|                 |                                          |
|-----------------|------------------------------------------|
| Start programme | <b>RDSsend 1</b> Communication port 1 or |
|                 | <b>RDSsend 2</b> Communication port 2    |

All data will be send to the encoder .....

### Extern synchronization Unit

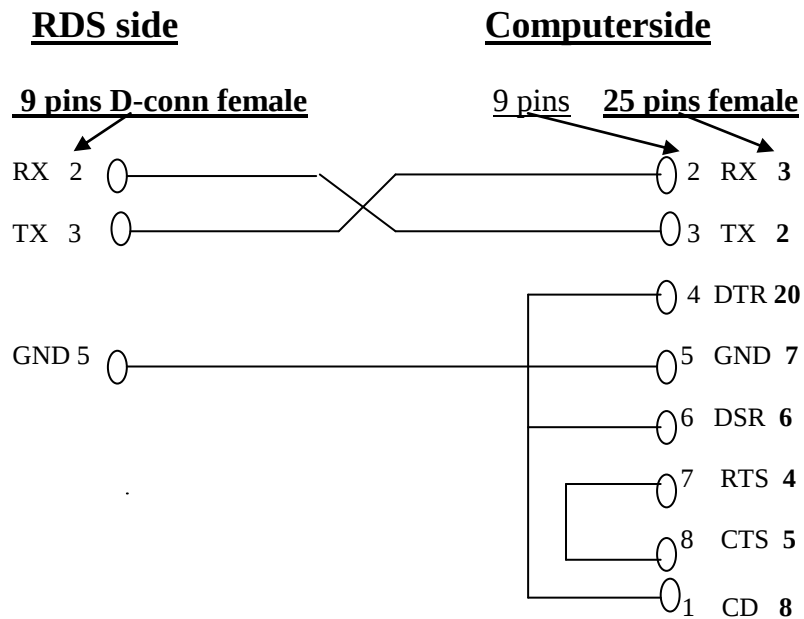
Standard the RDS encoder offers the possibility to connect a 19 KHz stereo pilot tone synchronization unit.

The RDS carrier wave can so be synchronized with the 19 KHZ pilot tone.

About the RDS connection cable. It is advisable to make it yourself to ensure proper connection.

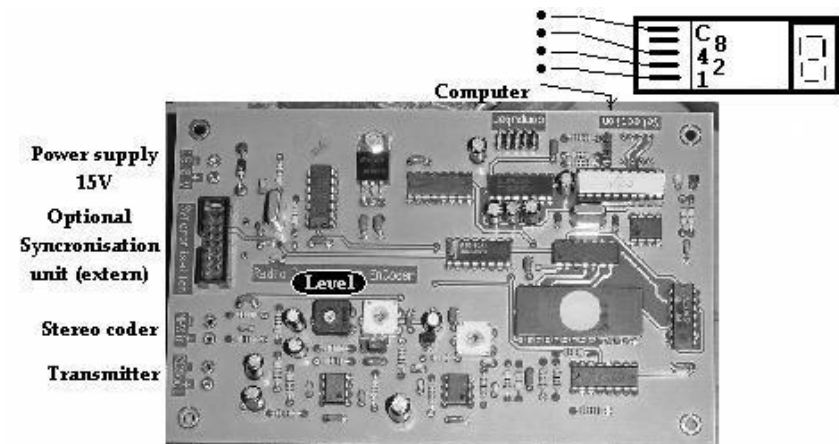
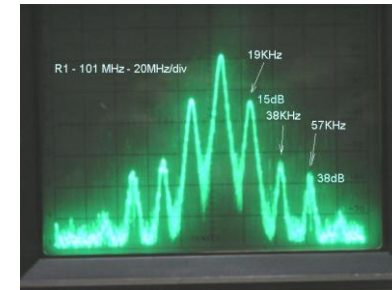
## Computer RS232 communication port connection

**RDS <-> PC cable connection:**



## Adjusting Stereo/RDS signal

A picture of a commercial Radio station gives a global performance of the levels of the RDS and pilot tone.



**Tip:** voor het schakelen van 8 banken (8 x 62 teksten) kun je gebruik maken van een BCD code schakelaar.

Als voorbeeld:

CONRAD : SMC-D tweetoets codeer schakelaar BCD-CODE

Conrad Boek 2002 bladzijde 750 (vergeet de zijschotjes niet)

### **Programmeren van de banken:**

Op de floppie disk staan BANK0 BANK1 BANK2 --- BANK7.bat

Deze zorgen voor de diverse copy handelingen.

Als je bank 2 gaat programmeren, zet dan de BCD code schakelaar op de RDS coder ook op 2.

Compoort staat standaard op com1, dit kun je wijzigen in bank0 t/m bank7 files

Achter rdssend staat een getal, dit geeft de communicatie poort aan.

