

## OPERATIONAL DESCRIPTION

To transfer information (data and control) from and to the electrodes, Wave Plus uses a single RF frequency in the ISM band, with GFSK modulation. Data are transferred from electrodes to the main receiver on a 14 mSec. frame basis; during the frame, each electrode has its own time slot to transmit a burst of data (Max Duty cycle:  $T_{on}=0.211\text{ms} \times 14 \text{ pulses}= 2.954\text{ms}$ .  $T_{on}+T_{off}= 100\text{ms}$ ).

At the beginning of each frame, the main receiver broadcasts a strobe signal to activate and lock the electrodes to the main cycle.

The output power and frequency of the RF modules are programmed in firmware at production time; these parameters are not alterable by the user.

The MINIWAVE electrode RF module is based on the single chip 2.4 GHz transceiver (nRF24LE1 from Nordic Semiconductors). The block schematic of this device follows:

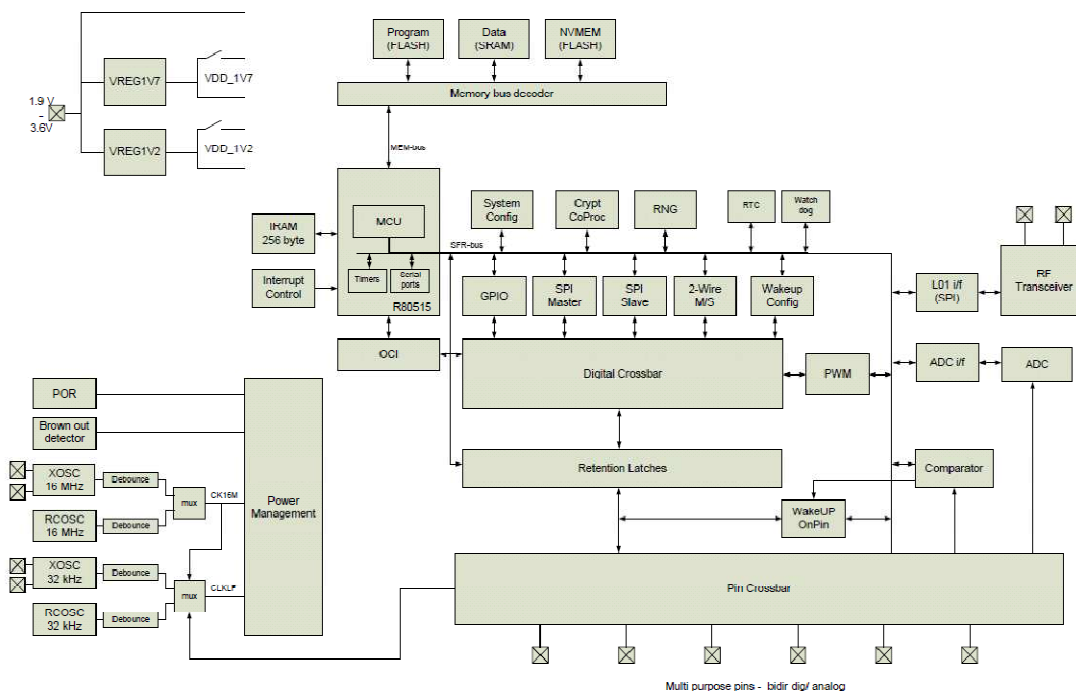


Figure 1. nRF24LE1 block diagram

This device contains all the RX/TX functions, and requires only an external crystal of 16.000 MHz, an external matching network to adapt the balanced ANT1/ANT2 input to the unbalanced 50 ohm antenna.

The MINIWAVE electrode is equipped with one nRF24LE1. The device is switched between RX and TX on a single frequency as follow:

- RX, to receive the activation command from the main receiver unit. The RX is also used during the operating phase, to lock the electrode to the system cycle. The RF frequency used is always the same for all the electrodes (up to 16 electrodes)
- TX, to transmit the EMG data to the main receiver unit.

The output power and frequency of the RF modules are programmed in firmware at production time; these parameters are not alterable by the user.

The MINIWAVE electrode is equipped with an integral whip antenna, not accessible to the user.

The MINIWAVE is the miniaturized version of the WAVEPLUS electrode, already granted with the FCC code Y9SWPTX; all functional characteristics are the same of the standard version.