Hardware design and implementation.

This phase covered from the first definitions and node specifications, to the system mounting and implementation. Goals:

• Requirements definition and general node specifications. Stablishment of constraints and design criteria.
• Radio wireless interfaces and other used components evaluation (microcontroller, serial interfaces...).
• Hardware full design. Selection of the components. Design adjustments and previous work verification. Layout design.
• Hardware platform implementation.

Software design

Once the hardware was operating, the work turned over the software. Goals:

• Full adaptation of the developed firmware to the hardware.
• Software implementation of required functions and application. Source code debugging.
• Generation of first documentation about the developed software modules.

Tests and evaluation.

Finally the proper operation of the device was evaluated and its results analysed.

• Fully integrated hardware and software test. Spectrum sensing, power consumption, autonomy and control, communication among nodes, connectivity to other devices, protocol stacks...
• Results interpretation and conclusions review. Statement of further studies and future development lines. Found problems evaluation.

Documentation generation.
Dissertation and other required documentation (wiki, papers, manuals, etc.) writing. Dissertation will be ellaborated under LATEX[11]. Review of the software documentation.

OUTLINE

In Chapter 2 takes place a whole State-of-the-art review that introduces to terms as CR, CN, WSN, or CWSN. Current hardware and software implementations are studied and main features exposed. In Chapter 3 is made a review of the necessities and gaps unattended by current devices. Requirements and first conclusions to face the design are obtained. Chapter 4 covers the design proccess. Schematics, used components and design decissions are covered in detail.