Development Environment for the RF-controller

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ABSTRACT

Integrated circuits and micro controllers are evolving rapidly. The best products have to use the latest controllers with advanced development environment. However the support for development tools will come gradually later on. Additionally many development boards and tools require licences and are too complex and expensive for schools and universities.

The nRF24LE1D is a highly integrated radio controller chip and it is very simple to use for a stand-alone RF-sensors and other RFID applications. It is very suitable for ambient intelligent technology because of its wireless features. This SOC (System on Chip) controller includes all necessary features for a wireless sensor network and smart network topology. With size of 4 x 4 mm and with few external components it is suitable for various embedded, small-size and low-cost wireless applications.

At Seinäjoki University of Applied Sciences the development environment for this radio controller has been developed mostly by students. All relevant documents for electronics and software are free to download in Internet, the tools are free to use of other students, schools and hobbiests. The students have developed the whole environment by themselves except C-compiler. The most important elements are USB interface, HEX-code transfer routines for RF controller chip and the development user interface.

The complete wireless network has developed also mostly by the students. The network has ad-hoc mesh topology with a very small low-power RF-devices including 3D acceleration sensors or various meteorological sensors. This network is tested in greenhouses and will be used for example in cattle houses to monitor the behaviour of the cows.