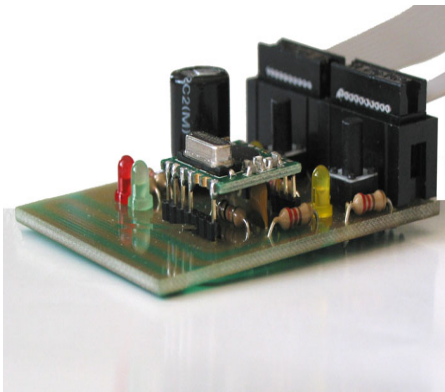


The RFM12B expansion board

Written by Jurij Mikeln - Last Updated Wednesday, 01 August 2012 11:34



The RFM12B expansion board offers MiniPin II and MegaPin users a cheap platform for developing short-range RF communication using RFM12B transceiver modules. The RFM12B is a low-power version of RFM12 module. It operates from 2.2 to 3.8 Volts.



RFM12B are half-duplex [1] transceivers that communicate on the 433 MHz UHF band. These very small and cost-effective modules are capable of transmitting and receiving on presettable channels with a defined bandwidth. All of these parameters will be configured by our program. To start off, let's learn more about RFM12B modules. A block diagram of the RFM12B is shown in Figure 1.

The RFM12 module is rated for 10 mW output power, corresponding to ITU standards for the 433 MHz band. There is also a high-power version, the RFM12BP, which is intended for the 868 MHz band and delivers 0.5W of output power. Typical use of RFM12B would be:

- remote control,
- home security,

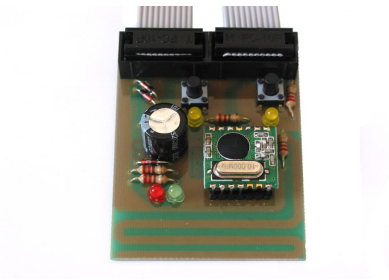
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- wireless keyboards and other PC peripherals,
- toy remote control,
- wireless key,
- telemetry,
- smart meters etc..

Main features:

- stable and accurate FSK modulation with presettable frequency deviation,
- programmable receiver bandwidth resolution,
- differential antenna connection,
- SPI compatible serial interface,
- analog and digital signal strength indicator and many other features as described in [2].



The RFM12B has a built-in microcontroller which accepts external commands, enabling it to perform reliable communication. On its own, the module will not transmit or receive: it needs parameters loaded into it. With the help of our Bascom program, it will become a fully-operational communications device.

Description of the RFM12B

Expansion board (EB)

The RFM12B EB features transmission and reception of message blocks. The communication reliability depends mostly upon the antenna used, the distance separating the transmitter and receiver and the presence of interference (a strong, nearby transmitting station on a close frequency) or the terrain (tall buildings, trees etc.).

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The RFM12B EB module has a built-in PCB antenna. This may not be the most effective antenna, but it should serve our purposes. The RFM12B EB is connected to either a MiniPin II or MegaPin board via two IDC connectors wired up to two free ports on the development board. We have chosen PortB and PortD. PortB was chosen as it contains the AVR's SPI port while PortD contains the INT0 and INT1 interrupt inputs. There are two built-in LEDs to indicate the receive/transmit signals, and an additional two LEDs to serve as status indicators (i.e. if the received data is correct, then turn on an LED).

The RFM12B EB has also two built-in switches, which can be used to trigger a data transmission.

We can only use one RFM12B EB with a MiniPin II / MegaPin board, at a time. If we want to test communication between two MiniPin II / MegaPin dev. boards then we would load different programs into each of the boards. We have written two programs: one for receiving and one for transmitting.

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