

**Proposal:** **Bachelorthesis**

**Subject:** **Implementation and Evaluation of the Wireless M-Bus Protocol on Hardware Testkits**

**Description:** The energy grid of the future, the so-called Smart Grid, is supposed to not only distribute power, but also information. Different technologies are being used to enable this communication. While wired technologies, such as narrow-band powerline communication seem to be a good choice for the communication in the grid itself, most existing protocols for the communication within the household rely on wireless transmission. One of these protocols is Wireless M-Bus (WM-Bus). This protocol would be used for example for a gas meter to enable wireless meter-reading. Therefore it needs to be energy efficient (uptime of ten years with one charge of battery), but also always-on (meter-reading could be taking place at any time). The WM-Bus also includes different modes of operation to realize different data-rates, different transmission frequencies and frame sizes as well as different degrees of robustness against noise.

The goal of this thesis is to implement different modes of the WM-Bus protocol running on a Texas Instruments TI CC1110 - testkit, which provides two complete SmartRF-boards with antennas (transmitter and receiver). The student will implement the protocol on the testkits' microcontrollers and analyse the performance in different (dynamic) geometrical and noise conditions.

**Prerequisites:** Profound knowledge in C-Programming  
Basic/Good knowledge of Microcontrollers  
Basic knowledge in Communications

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