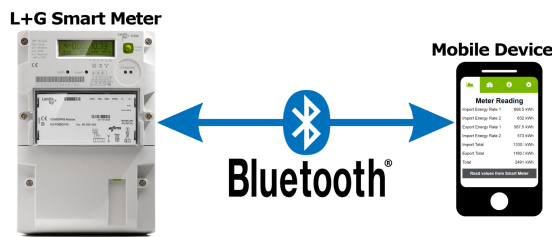Marcel Rohrer

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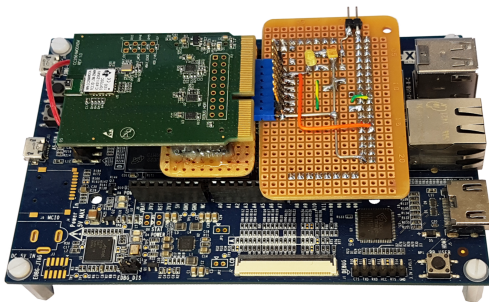
Bluetooth-Interface for Smart Meter

Wireless connection between L+G Smart Meter and a mobile device

Atmel SAMA5D4 Xplained Ultra Evaluation Board with TI-CC2564MODAEM Bluetooth Module on top

Web interface to readout data and configure the Smart Meter

Introduction: This research project was done for the company Landis+Gyr. It is about an embedded webserver with Bluetooth interface (wireless connection) for electricity meters (Smart Meter). The idea is to readout measurement data and configure the Smart Meter over a web browser on a mobile device. The hardware consisted of an Atmel microprocessor evaluation board and a dual-mode Bluetooth Module from Texas Instruments. These two components had never been used together before. Our task was to demonstrate the technological feasibility of a webserver which is fully accessible over Bluetooth and how to send/receive data from a Smart Meter.

Approach/Technologies: In a first step, we analyzed the Bluetooth technology in relation to the use cases of the Smart Meter and decided that the given Bluetooth Module would fit this application. In a second step, we tried to get these two modules to run with each other. We implemented a simple web service which proves the communication over Bluetooth between the Evaluation Board and a mobile device with standard internet protocols. Finally, we also worked out a secure pairing strategy to pair any mobile device with a Smart Meter.

Result: During this project, we had some problems with the provided Bluetooth module and came to the conclusion that the TI Bluetooth module will not work with the Atmel evaluation board. The reason is that this Bluetooth module needs an external Bluetooth stack and the Bluetopia stack cannot be ported to our Atmel Evaluation Board. Upon consultation with Landis+Gyr, we worked out an alternative solution and configured the webserver on a Linux Ubuntu platform, where all drivers and packages were available. To setup Bluetooth tethering (allows sharing the network connection over Bluetooth), we used the BlueZ Bluetooth stack which is common on Linux operating systems. For the user interface, we implemented a simple website with some visible measurement data and configuration options. Because no real Smart Meter was available to us, we simulated the Smart Meter functionality for this demonstration with a C++ object model.