



## Bachelor's Thesis | 2019 |

Degree programme  
*Systems Engineering*

Field of application  
*Infotronics*

Supervising professor  
*Prof. Rieder Medard*  
[medard.rieder@hevs.ch](mailto:medard.rieder@hevs.ch)

Partner  
*Studer Innotec SA*

## Remote Control Center Communication Gateway

Graduate

Elliott Walpen

### Objectives

Provide Studer Innotec SA a solution for the users of their Xtender legacy line of inverters, that will follow the commonly recognized SunSpec specification by the solar industry, materialized by the realization of a communication gateway.

### Methods | Experiences | Results

The development platform chosen for the project is a Raspberry Pi 3B+ allowing access to multiple communication channels, such as Ethernet, Wi-Fi, Bluetooth 4.2, BLE and serial lines.

The firmware implements the StuCAN2 stack, private proprietary protocol of Studer Innotec SA, and a ModBus TCP/IP server conforming to SunSpec specifications. SunSpec Alliance also defines information models to standardizes monitoring and controlling solar plants. Therefore, a match between Xtender accessible readable/settable attributes and SunSpec information models was executed.

The gateway receives and sends SunSpec well-formed data through SunSpec ModBus TCP/IP protocol over Ethernet and Wi-Fi.

Tests were performed with a dedicated desktop application using the official python library provided by SunSpec Alliance and validates information models inside the gateway. In addition, preliminary tests were done with a PLC controlled by an HMI and confirm the gateway's behaviour.

The next steps are to monitor other Studer Innotec SA devices and also to benefit of other communication channels available the Raspberry Pi to convey SunSpec data.