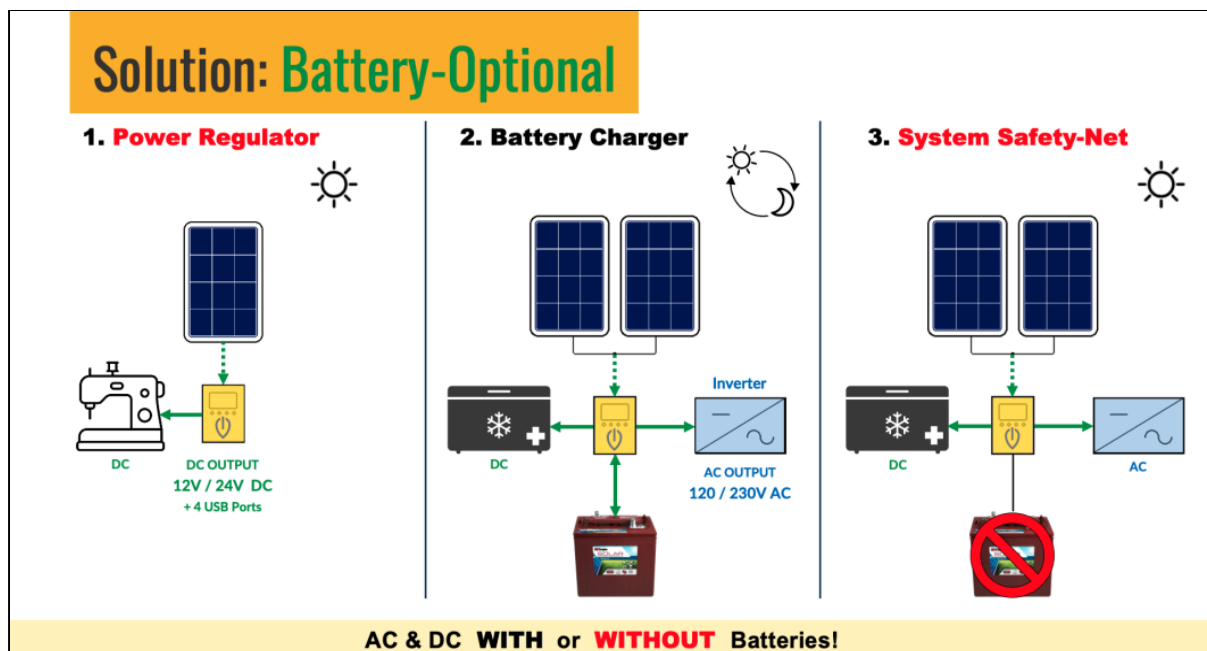


Solar SEED - Master thesis project proposal



Background:

Solar SEED develops off-grid solar power converters aimed predominantly for development and humanitarian applications (500W-700W). The innovative Smart Controller technology creates a unique battery-optional off-grid system. The possibility of delivering power without batteries reduces start-up cost by up to 70%, lowering barriers to provide electricity and empower income generating opportunities for end users. The system is scalable; batteries and/or inverters may be added at any time to assemble a complete yet portable multi-modal power system able to energize homes, micro, small to medium businesses enterprises (MSMEs), refugee camps, rural health clinics and schools.



Scope:

This thesis project will be carried out in collaboration between Solar SEED and Lund University (Division of Industrial Electrical Engineering and Automation), and is focused on developing functions for and testing of the latest Solar SEED Smart Controller (700 W) prototype. The thesis work contains the following items-

- Implementation of automatic switching mechanism; direct drive mode to/from solar battery charger mode
- Integration of power electronic buck converter and charge controller with Solar SEED prototype
- Development & implementation of multi-stage battery charging algorithms
- Development & implementation of Maximum Power Point Tracking (MPPT) charging algorithm
- Testing Solar SEED Smart Controller prototype (verify function of developed algorithms, evaluate algorithm and prototype performance, ...)

Desired profile:

- Knowledge of power electronics (circuits/converters, renewable energy applications)
- Knowledge of FPGA and embedded circuits
- Knowledge of control concepts (PWM for power converters, MPPT)
- Software development (C programming, ...)

Starting date:

Early spring 2022.

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