C2000 Renewable Energy Developer's Kit Overview

The TI Renewable Energy developer's kit is designed to work with Texas Instruments C2000 microcontrollers. This kit is a part of TI's digital power tools package designed to give customers an opportunity to quickly evaluate TI C2000™ products for power conversion applications at a safe input voltage and power level. This system will allow implementing all the major functions of a solar and/or a renewable energy system. These functions include front-end DC to DC conversion, three or single phase inverter operation, synchronizing inverter output with the AC line, DC to DC buck operation for possible battery charging. This board offers all the voltage and current measurement hooks so that one can create and test new topologies, techniques etc.

The solar board is a flexible hardware platform that allows system designers evaluate various pieces of a solar energy system. This board takes in a DC input from a panel or from any other DC source and offers various power electronics hardware to implement all the functions of a solar system. The power electronics modules can be controlled using a C2000 controller and the board offers an easy interface with any of the plug-in C2000 controlCARDs™ for quick evaluation of C2000 controllers for these applications. The controller card interface is the standard 100-pin DIMM socket interface. Included with the kit is an F2808 controlCARD, which the kit software is designed for.

1 Key Features

- Compatible with any of the plug-in C2000 controlCARDs.
- Front-end single phase DC/DC boost converter.
- Three phase or single phase inverter output.
- Single phase DC/DC buck converter for battery charging.
- Hardware Relay to switch between Panel and Battery.
- AC line (110 V or 220 V) synchronization for the Inverter Output.
- Input Panel/DC voltage less than 20 V.
- Inverter output voltage 30 VAC (peak).
- Rated output current 2 A.
- Battery voltage 12 V.
- Onboard single phase inverter output filter.
- Onboard light bulbs for DC/DC buck and Inverter output load.
- Onboard control power supply generated from a single 5 VDC input.
- Onboard RS232 port.
- Onboard JTAG port.
- Onboard booting option jumpers.
- GPIO header for interface expansion.
- UART communications header available for host control.
- A learning platform allowing the user to easily probe the most significant wave forms within the board.
- Host GUI, a friendly way to control / demo the application, based on open source C# freeware.
- Hardware Developer's Package that includes schematics, bill of materials, Gerber files,…etc.

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