Renewable Energy Trickle Charger, 1.5 Amp Rating

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Final Project Report

December 7, 2012
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ENG W421 Technical Writing Project

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Abstract

The goal of this Senior Design Project was to produce a renewable energy trickle charger capable of maintaining a 12-volt lawn tractor battery. This system will use a wind turbine and a solar array to produce electricity.

The major hardware components of this system are: a wind turbine, solar array with the ability to track the sun, a charge controller that will maintain a 12-volt battery, and a Teensy development board that will enable solar tracking and data collection of the electricity produced. The charge controller uses a relay to divert power to the battery when it needs to be charged.

The major software components of this system are: software code for the Teensy development board, CoolTermWin for serial data capture, Windows 7 as the operating system, and Microsoft Excel. This system will collect data from the battery, wind turbine, and solar array and store that data in a text file. Microsoft Excel will import the data from the text file and display it in the spreadsheet along with manipulated data to show actual voltage values. The software code was written in Arduino language using the Arduino Integrated Development Environment (IDE).

I have a working prototype that meets all the requirements for this project. I have fully tested the prototype and I am satisfied with the performance of this system.

Keywords: Charge controller, Wind Turbine, Solar Array, Teensy development board, Arduino
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