

Solar data logger into MMC/SD Memory Card

The project aims at designing a logging system of time along with the solar energy. The logging takes place into an MMC/SD card. The logged data can be moved to PC for analysis.

Power plays a great role wherever man lives and works. The living standard and prosperity of a nation vary directly with the increase in the use of power. The electricity requirement of the world is increasing at an alarming rate due to industrial growth, increased and extensive use of electrical gadgets. According to world energy report, we get around 80% of our energy from conventional fossil fuels like oil (36%), natural gas (21%) and coal (23%). It is well known that the time is not so far when all these sources will be completely exhausted. So, alternative sources should be used to avoid energy crisis in the nearby future. The best alternative source is solar energy. So, the analysis of solar energy seems to be very important.

The controlling device of the whole system is a Microcontroller. Solar panel, MMC/SD card, Real Time Clock, LCD, MAX232 are interfaced to the Microcontroller. The Microcontroller continuously calculates the solar energy and logs it into MMC/SD card along with time it gets from Real Time Clock module. The logged data can be periodically copied to PC. The system provides the provision for formatting the MMC/SD card. Also, the current energy from solar panel can be seen on LCD. To perform this task, Microcontroller is loaded with an intelligent program written using embedded 'C' language.

The major features of this project are:

1. 2GB Memory available for storing the data.
2. RS232 based data transmission.
3. Provision for copying logged data to PC.

4. Store data of one year time.
5. Provision for formatting memory Card.

This project provides us learning's on the following advancements:

1. SPI protocol implementation.
2. I2C protocol implementation.
3. Interfacing of RTC module to Microcontroller.
4. Interfacing of Solar panel to Microcontroller.
5. Interfacing the MMC/SD card.
6. Serial communication with PC.
7. RS232 data transmission.
8. Embedded C programming.
9. PCB design.

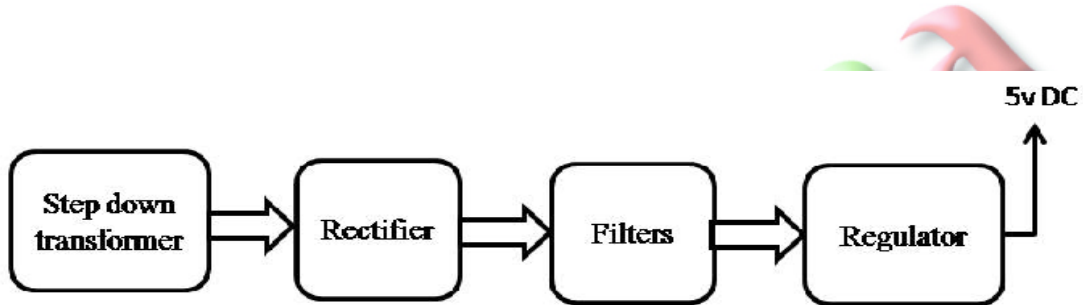
The major building blocks of this project are:

1. Regulated Power Supply
2. Microcontroller.
3. Solar panel.
4. Memory Stick (MMC) with driver.
5. LCD with driver
6. MAX 232.
7. Real Time Clock (RTC).
8. Reset.
9. Crystal oscillator.
10. LED Indicators.
11. Control buttons.

Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

Regulated Power Supply:



Block Diagram:

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