Monitoring of Solar Water Pumping System

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Abstract - ***Due to the continuous decrease of the solar cells cost, photovoltaic energy is used in diverse applications. The most important one is the batteries-coupled water pumping system powered by photovoltaic generators. This paper investigates a remote monitoring system using Zigbee. These nodes send data wirelessly to a central server, which collects the data, stores it and will allow it to be analyzed then displayed as needed and can also be sent to the client mobile.***

Key words **- Photovoltaic System, Controller, sensors, zigbee, SDcard.**

1. INTRODUTION

Solar energy is unlimited energy source. Most common renewable energy source available everywhere is solar energy. Is the next generation there are lack of limited energy sources remains so that solar energy is very much important in future.

Renewable energy comes from resources which are naturally replenished on a human timescale such as sunlight, wind and geothermal heat. Most common renewable energy source available everywhere abundantly is solar energy. Oil natural gas and coal together provide 86% of the world primary energy. Contribution of renewable energy solar, wind, geothermal currently is less than 2% of the worlds primary energy supply, and although growing very rapidly. By considering large demand of fossil fuels at the end of this century all non renewable energy sources likely to be end. In this proposed project we are going to design farmer friendly hybrid solar PV operated water pumping and solar thermal drying system. Developing clean environmental friendly low cost solar PV operated pumping system".

2. PROBLEM DEFINITION

The energy sources are very much important concept in the next few years. There are many more energy sources that are almost near to die. So that using the solar energy in our day to day life is quite improving and energy saving concept. Solar power is an life time energy source it will not going to be shortage at any time so that we are focusing to design a model water motor pump which will be wok on solar energy.

2.1 Related Work

Ejiofor Virginia Ebere, Oladipo Onaolapo Francisca Water scarcity is one of the major problems facing major cities of the world and wastage during transmission has been identified as a major culprit; this is one of the motivations for this research, to deploy computing techniques in creating a barrier to wastage in order to not only provide more financial gains and energy saving, but also help the environment and water cycle which in turn ensures that we save water for our future.

V. B. Shinde and S. S. Wandre the description of reviews on a photovoltaic irrigation system, is presented. Photovoltaic water pumping system is one of the best alternative methods for irrigation. The variation of spatial and temporal distribution of available water for irrigation makes significant demand on water conservation techniques.

G. G. Merino, L. O. Lagos, J. E. Gontupil a direct coupled photovoltaic (DCPV) pumping system has been monitored and evaluated in order to assess energy losses due to mismatching between the photovoltaic (PV) array and the pump motor and to identify the errors associated with traditional procedures used for PV system sizing.

3. PROPOSED WORK

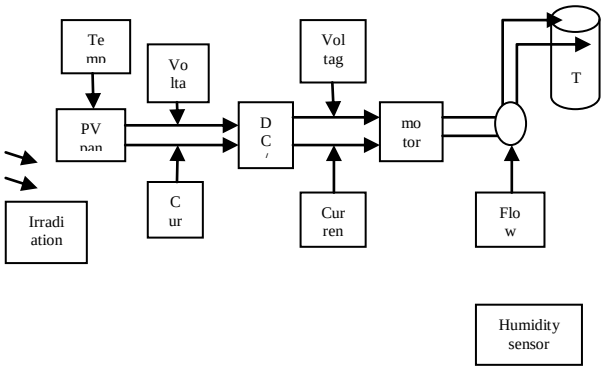

Fig -1: Block diagram of system

Transmitter:

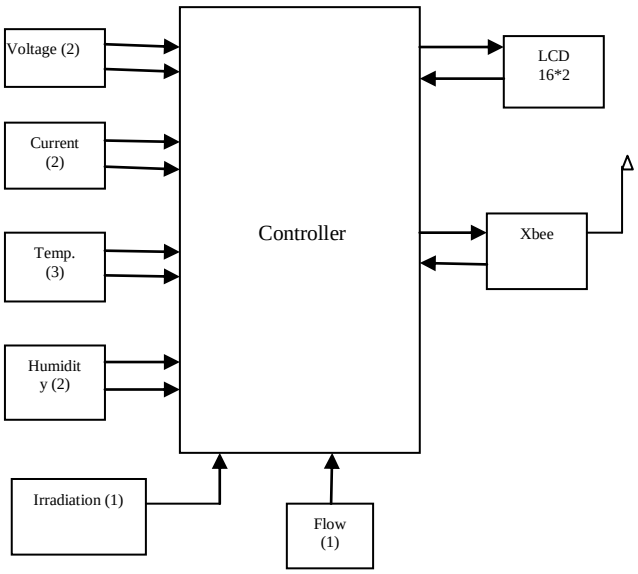

Fig -2: . Proposed interfacing of controller

Receiver:

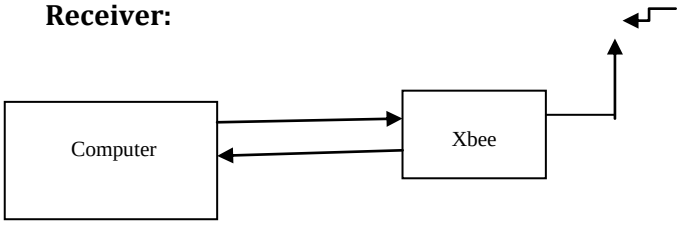

Fig- 3: Xbee receiver

4. DESCRIPTION

Above block diagram shows that microcontroller, temperature sensor, radiation sensor, flow sensor, humidity sensor and voltage &current sensors also an LCD display and storage device. Each sensor senses its appropriate value and display on LCD display and also storing the data into the external storage device.

The radiation sensor named as pyranometer is measuring the light intensity coming from sun to the solar panel. The light intensity then converted into the current and its going to be displayed on the LCD display.The flow sensor YF-S201 which having an working range 1-30 min/L. it is using to measure the pressure of water which is coming from the water tank to the system. The it convert its measured pressure into the analog signal and then displayed on the LCD display.

Temperature sensor is used to measure the temperature of different places. The sensed temperature is converted into analog signal and then it goes to microcontroller and then displayed on the LCD display. Same as humidity sensor convert the sensed humidity and converted analog signal given to the microcontroller and using this it displayed on the LCD display. Resistor series and shunt design is used to measure the current and voltage across it. Every output signal come from the microcontroller is going to display on the LCD display as well as it is going to store in the computer hardware by using the xbee or any other module.

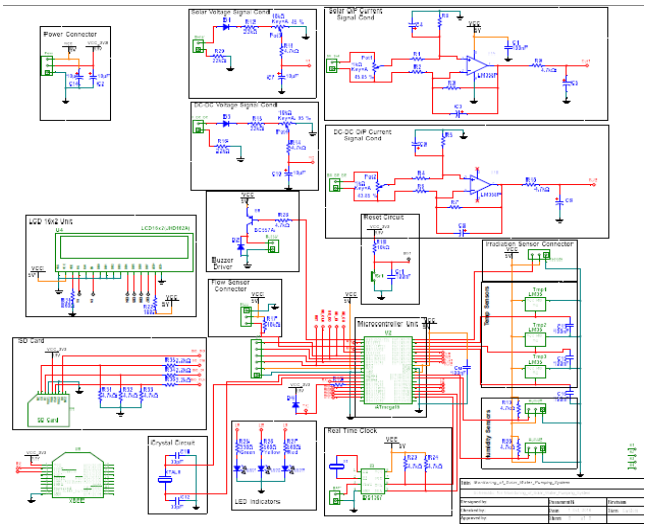

Fig- 4: Circuit diagram

5. RESULTS

Table1:Parametersreadingsfrom11.45am to 11.49am

Sr. No.	Parameters	Time			
		11.50 am	11.51am	11.52 am	11.53 am
1	Rad	569	628	628	544
2	Tmp1	29	29	29	29
3	Tmp2	29	28	28	27
4	Tmp3	29	29	29	29
5	Hum1	26	26	27	28
6	Hum2	21	21	21	22
7	WFlow	3.3	3.2	3.2	3.5
8	V1	18	19	0	0
9	I1	0.00	0.00	0.00	1.26
10	V2	14	13	0	2
11	I2	0.00	1.26	1.26	0.00

Table 2: Parameters readings from 11.50am to 11.53am

Sr. No.	Parameters	Time			
		11.50 am	11.51 am	11.52 am	11.53 am
1	Rad	569	628	628	544
2	Tmp1	29	29	29	29
3	Tmp2	29	28	28	27
4	Tmp3	29	29	29	29
5	Hum1	26	26	27	28
6	Hum2	21	21	21	22
7	WFlow	3.3	3.2	3.2	3.5
8	V1	18	19	0	0
9	I1	0.00	0.00	0.00	1.26
10	V2	14	13	0	2
11	I2	0.00	1.26	1.26	0.00

6. ADVANTAGES

1) Solar energy is cost-effective and reliable source of energy.

2) Government is helping the farmers to use of the drip irrigation. For drip we can easily use solar PV operated water pumping system.

3) The costs are reduced as smaller solar panels can be used.

7. APPLICATIONS

1) Solar pumps are useful where grid electricity is unavailable.

2) Alternative sources particularly wind do not provide sufficient energy.

3) Useful in small scale or community based irrigation.

4) It can be widely used in big hotels boarding and more places.

8. CONCLUSION

Wireless monitoring of field not only allows user to reduce the human power, but it also allows user to see accurate changes in it. It is cheaper in cost and consumes less power.

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