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IOT Based Load Control In Hybrid Power System

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***Abstract*— This electronic document is a "live" template and already defines the components of your paper [title, text, heads, etc.] in its style sheet. The interconnection of small modular devices such as photovoltaic, small wind turbines and storage devices, commonly storage batteries to a Low Voltage distribution system leads to a new energy system known as the Microgrid. This project presents the modeling and operation of microgrid with wind and photovoltaic resources. With the help of IOT, the amount of generated power can be observed. Switching circuit acts a control over the load, transmits the required amount of power according to the load requirement. Later the switch will turn off the power supply when there is a shut down. Batteries are used to store the energy. Transformers are used for transmitting the power to distribution. As there are 1 phase & 3 phase requirements, power is supplied accordingly. Initially voltage is maintained at 230v for the residential purpose. For the Industrial and Commercial purpose, the power is either supplied directly or stepped up with a help of a transformer. LDR circuits are used as a sensor to avoid further damage caused by fire during the power generation. LDR are used as a protective device for the circuit. Microcontroller receives all the information from the different devices and controls the circuit. Due to high demands of the load from different direction, switches acts as a controlling circuit to avoid the traffic and supplies the required amount of power accordingly. IOT will update all the information regarding the requirement and amount of power transmitted. LCD will display the amount of energy generated and stored in batteries, and also will display the generated voltage status from Wind & Solar. Regulators are used for the constant flow of charges from the batteries.**

***Index Terms*— IOT, Photovoltaic modules, Energy storage, Wind power generation.**

I. INTRODUCTION

IOT are the future scope, Internet of Things represents a general concept for the ability of network devices to sense and collect data from the world around us, and then shares that data across the Internet where it can be processed and utilized for various interesting purposes. With increasing concern of global warming and the depletion of fossil fuel reserves, many are looking at sustainable energy solutions to preserve the earth for the future generations. Other than hydro power, wind and photovoltaic energy holds the most potential to meet our energy demands. Alone, wind energy is capable of supplying large amounts of power but its presence is highly unpredictable as it can be here one moment and gone in another. Similarly, solar energy is present throughout the day but the solar irradiation levels vary due to sun intensity and unpredictable shadows cast by clouds, birds, trees, etc. The common inherent drawback of wind and photovoltaic systems are their intermittent natures that make them unreliable. However, by combining these two intermittent sources and by incorporating maximum power point tracking (MPPT) algorithms, the systems power transfer efficiency and reliability can be improved significantly.

When a source is unavailable or insufficient in meeting the load demands, the other energy source can compensate for the difference. Several hybrid wind/PV power systems with MPPT control have been proposed and discussed in works Most of the systems in literature use a separate DC/DC boost converter connected in parallel in the rectifier stage o perform the MPPT control for each of the renewable energy power sources.

II. BLOCK DIAGRAM

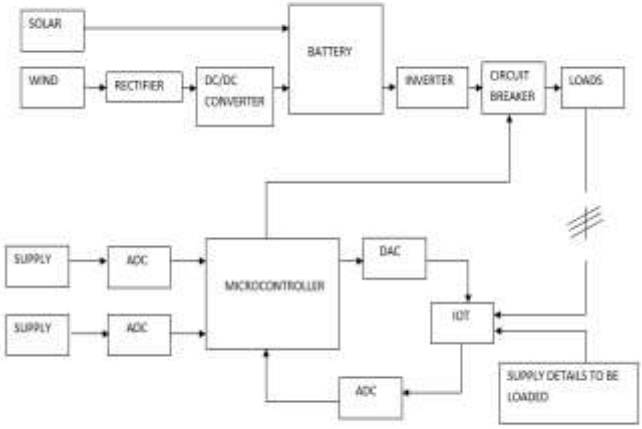

Figure 1. Block diagram of micro grid

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III. GENERATION PART OF PROPOSED MODEL

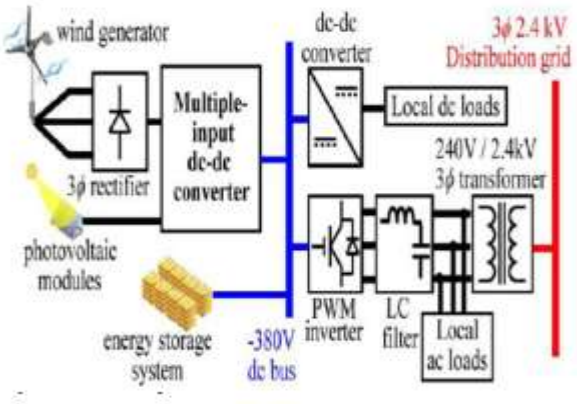

Fig 2.1 Micro Grid Diagram

VI. BLOCK DIAGRAM DESCRIPTION

2.3 a) Flame Sensor

An LDR is used as a flame Sensor. And the output is give n to a Digital input of the Controller. So when the Flame is sensed we can give alarm +Visual Indication and immediately transfer the Message to a nearby Fire Station.

2.3 b) Relay

Relays are electromagnetic switches used as protective devices, indicating devices and as transmitting devices. Protective relay protect good component from the effects of the circuit components that have failed. Transmission relay are used in communication systems. Indicating relay may be used to identify a component which has failed.

2.3 c) Solar

Solar power is energy captured from the sun. The tremendous energy discharged by the sun each day is harnessed using various solar technologies available today. Solar energy systems can be either active or passive.

2.3 d) Wind Energy

Wind energy has been used for pumping water and milling grain for hundreds of years. More recently, wind energy has also been used for electricity generation. Developing countries can take advantage of wind power on a small scale, both for irrigation (wind pumps) and for generation of electricity (wind generators).

2.3 e) Dc motor

Although motor gives 60 RPM at 12V but motor runs smoothly from 4V to 12V and gives wide range of RPM, and torque, 60RPM Centre Shaft Economy Series DC Motor is high quality low cost DC geared motor.

V. INNOVATIVE PART OF THE PROPOSED NETWORK

IOT gives the update about the amount of power transmitted & also gives the information regarding the load required.IOT updates the user regarding the power generation. Both Solar & Wind power can be combined, and given as a single source for the grid. Efficiency will be very high as both are natural resources. Microcontroller will receive all the information regarding the power generation and will act wisely. LDR are used as a protective device for the circuit. LDR circuit acts as a sensor, sends the information to the Microcontroller. LCD display gives the output regarding the power generated. Switching circuits acts as a controller device. Load is shared equally to all the different loads.

VI .FUTURE SCOPE

IOT based controller can be directly used for controlling the device, and can also be used for the safety measures. Along with SOLAR & WIND power generation, HYDRO power generation can also be added to fulfill the demands.

Wind & Solar energy is available without any cost and it does not emit any greenhouse gases. This makes it a great source of energy production for any developing state. The field of wind energy has tremendous scope for innovation, translating to real world applications and tremendous economic opportunity. It is crucially important for India, as our economy continues to evolve, and we must ensure every Indian has access to opportunity, decent jobs and livelihood. For that we will need greater resources. Clean, sustainable, renewable-and equally important, domestic sources of energy are essential to fulfill the potential of India in the coming years and it is certain that wind energy will play a major part in shaping India's future. Wind power has emerged as the biggest source of renewable energy in the world.

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VII. SOCIAL RELEVENCE

- In Remote areas implementing power systems units at each apartment.
- Multistoried buildings
- Homes, schools.
- Street lightings covering a large area.
- Off grid applications.
- Solar water heaters. Electric kettles solar vehicles
- Traffic signaling and in many applications

VIII. LIMITATIONS

- Maintenance of battery
- Implementation of IOT to receive data
- Maintaining the voltage constant
- Equal amount of power sharing

IX. ADVANTAGES

- Continuous power supply
- Combining 2 or more renewable energy sources
- Generation of large power
- Pollution free

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