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Table of Contents

S. No.	Title	Page No.
1	A Microstrip Patch Antenna with DGS in Ka Band for 5G Applications	1-4
2	Impact Of Mole Concentration and Well Width on Band Gap and Optical Response of GaInP/AlGaInP Heterostructure	5-8
3	The Electric Power System of the Future Is a "Smart Grid"	9-12
4	Comparative Analysis of Non-Isolated Boost Type DC-DC Converters for PV-based Application	13-18
5	Effects of Parasitic Elements in Microstrip Patch Antenna	19-23
6	VLSI Implementation of Swarm Unit for PSO Algorithm	24-28
7	Hardware Implementation of Notch IIR Filter	29-33
8	Exactly-once Stream Processing, High-throughput and Low-latency with Apache Flink™	34-39
9	Optimization of energy storage for renewable energy sources: a brief overview	40-42
10	A Review on the Detection of Power Quality Disturbances Using Wavelet Transform	43-47
11	Cloud Based Smart Energy Meter	48-51
12	Hetero-structured Thin Film Solar Cell -An Overview	52-55
13	Innovative Security Technology for KYC Documents Record Maintenance	56-59
14	Analysis of Electro-Optical Parameters for Cobalt Blue High Efficient Organic Light-Emitting Diode Device Structure	60-66
15	Design and Analysis of a Compact Size 4-element MIMO Antenna for Millimeter Wave 5G Communication Systems	67-70
16	Quantum Dots: A Review	71-77
17	Tin oxide (SnO ₂) based Thin Film Transistor: A Review	78-81
18	Design and Development of a Touchless Hand Sanitizer Dispenser Machine	82-85
19	A Study of Deutsch Jozsa Algorithm on Computational Basis	86-88
20	Circularly Polarized Patch Antenna With Gain Enhancement Using Reflector	89-91
21	A Review of Stateless Opportunistic Forwarding Analysis of Latency in Intermittently Connected Networks	92-98
22	RRAM Technology: A Promising Non-Volatile Memory Solution	99-102
23	A Biodegradable Transparent Substrate from Waste Materials towards Flexible and Transient Electronics Applications	103-106

Cloud Based Smart Energy Meter

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Abstract—In the rapidly expanding sector of energy measurement, the idea of a smart energy meter system aids in eliminating this discomfort. Although Smart Energy Meter (SEM) is a very effective technology, it necessitates the expensive replacement of conventional energy metres with smart energy meters. Thus, the project's main focus is on employing Wi-Fi technology to measure energy and calculate tariffs. The design of smart energy meter's included a post-paid appropriation scheme. This helps to decrease human errors by retrieving real-time metre values via microcontroller and sending them to the customer's mobile phone via GSM Module.

Keywords— Smart energy meter, Internet of Things (IoT), Atmega328P micro-controller, Wi-Fi.

I. INTRODUCTION

Energy measuring advancements have exploded in recent years, allowing for more efficient and dependable utility system operation and administration. The rising demand for electricity in this era of energy scarcity has necessitated the installation of additional EB metres, as well as the development of novel methods for measuring metre readings and monitoring energy efficiency. Smart Energy Meters (SEM), which use analogue or digital smart meter data with the aid of smart meter, are one such recent advance in energy monitoring. Currently, energy measuring is done manually, which is labor-intensive and problematic given the daily expansion of connections in a country with a dense population [1]. The electricity board employee who reads the energy metre and turns over the bills to the home's owner each month can be seen standing in front of our house. This is merely a metre readout. According to such reading, we are required to cover the costs. The main drawback of this strategy is the need for someone to travel from neighbourhood to neighbourhood reading the metres of each house and handing out the invoices. Numerous mistakes happen, like an excessive bill amount or a communication from the power board even though the payments have already been made. In order to fix this problem, we came up with a plan that cuts out the middleman and eliminates mistakes between the client and the service provider.

In the rapidly expanding field of energy measurement, the system idea aids in overcoming this discomfort. Although SEM is a very effective technology, it necessitates the expensive replacement of conventional energy meters with smart energy meters. As a result, this initiative focuses on employing Wi-Fi technology to measure energy and calculate tariffs. Smart Energy Meters were structured with post-paid appropriation system.

This can help to eliminate human errors by accessing real-time metre values via microcontroller and sending them to the customer's mobile phone via GSM module or to a web page via Wi-Fi module. The administrator can look at the data on the customer's power usage and make a report from it online [2]. The prototype will be able to explain the billing system to consumers, collect power usage data from smart metres, store it in a centralised database, and generate reports.

Another purpose of this project to find the tapping in electricity transmission line because it is illegal to do. From this, we can find out where electricity is stolen. The web page we'll use is secured with a secret phrase by including a username and password, as well as secured API credentials. We also introduce a new function that is user will get notification when electricity consumption reaches to threshold value which is set by user. By consumer get help to maintain their electricity bill amount. Programming in C software and PROTEUS simulation software are used to carry out the simulation [3].

II. SYSTEM MODEL

Electric metre reading for power usage and billing is currently done by human workers from home to home and building to building in the current system. To achieve entire area data gathering and billing, a large number of personnel and a considerable working period are required. Billing by humans is prone to reading errors since the residential electric metre is sometimes positioned in an inaccessible location. The job of labour billing is sometimes limited and hampered by poor environmental conditions [4].