WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

LOAD MONITORING AND PROTECTION DEVICE

Tejas Keshav Holkar[1], Mirsab Moula Shaikh[2]

Student,Dept. of Electrical Engineering, Gramin Technical and Management Campus, Maharashtra, India
Student,Dept. of Electrical Engineering, Gramin Technical and Management Campus, Maharashtra, India

ABSTRACT -

In an period where imperativeness capability and security are crucial, there's a creating require for brilliantly systems that not because it were screen but as well manage electrical loads in real-time. This expand focuses to fulfill that require by arranging and making a sharp Stack Calculation and Confirmation Contraption utilizing components such as the ESP8266 microcontroller, hand-off module, inert essentialness meter, HW103 optocoupler, and Twilio's SMS take note system.

The system enables real-time watching and security of electrical devices by measuring voltage, current, and control utilization. Data is transmitted carefully to the ESP8266, which shapes it and disengages the stack within the occasion that a edge is outperformed, ensuring security. The uncommon integration of Twilio's API engages real-time SMS cautions, making it sensible for homes and businesses. Laid out to be low-cost and versatile, the system engages energy-saving behavior and gives both adjacent security and more distant openness.

Key Words: ESP8266, Inert Essentialness Meter, Stack Checking, IoT Security System, Twilio API, SMS Caution System, Exchange Module, Optocoupler

Introduction

Display day essentialness systems ask more clever, more profitable, and secure courses of action for overseeing electrical loads. With the growing entrance of electrical apparatuses in homes, work environments, and businesses, there's a essential need for systems that can freely screen essentialness utilization, recognize abnormalities, and guarantee contraptions from over-burdening or insufficiencies.

This paper presents a comprehensive course of action:
a Stack Calculation and Security Contraption utilizing progressed IoT components and cloud communication organizations. It highlights an ESP8266 microcontroller, dormant essentialness meter, HW103 optocoupler, hand-off module, and Twilio SMS advantage for disturbing. The contraption gives computerized over-burden security and more distant upgrades by implies of SMS.

1.1 Establishment and Motivation

Manual checking of vitality utilization isn't ceaselessly achievable. Over- burdens can cause enduring hurt or fire threats. Our contraption gives real-time supervision, security computerization, and convenient alerts—bridging the gap between sensibility and canny affirmation

1.2 Objective

To build a versatile, low-cost system

LITERATURE SURVEY

2.1 Early Stack Security Frameworks

Ordinary frameworks utilized electromechanical components like wires and MCBs.
Whereas solid, they needed mechanization and inaccessible highlights.

2.2 Microcontroller Integration

From 8051 to Arduino, microcontrollers empowered control-based frameworks but needed remote capabilities until ESP8266's discharge in 2014.

2.3 IoT and Cloud Integration

IoT stages (Twilio, Firebase) empowered vitality frameworks to send cautions, store information, and log real-time peculiarities.
Most existing frameworks needed dynamic stack security.

2.4 Development in Our Framework

Our framework coordinating:
Inactive meter for exactness.
ESP8266 for remote control.
Twilio for SMS cautions.
Hand-off module for security.
HW103 optocoupler for secure meddle.

Framework Plan

3.1 Piece Chart Outline

Vitality Meter creates computerized beats per kWh.
HW103 Optocoupler securely transmits flag.
ESP8266 calculates control and recognizes over-burden.
Hand-off Module disengages the stack.
Twilio sends SMS to caution client.

3.2 Component List

- ESP8266 Wi-Fi Microcontroller
- Inactive Vitality Meter
- HW103 Optocoupler
- 5V Hand-off Module
- Twilio API
- Stack (bulb)
- Jumper Wires, Control Supply

3.3 Working Guideline

The ESP8266 peruses vitality beats, calculates real-time utilization, and compares it to limits. On over-burden, it trips the hand-off and sends an SMS.

SIMULATION AND RESULTS

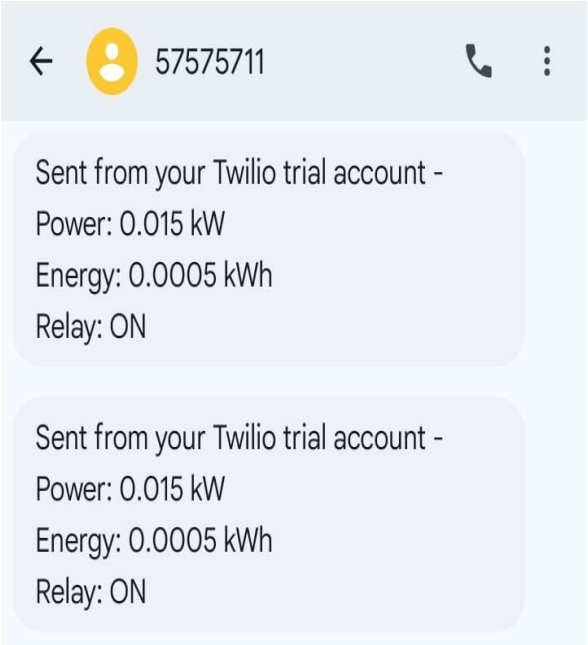
4.1 Stages Utilized

Arduino IDE for ESP8266 code reenactment
Twilio API Comfort for message testing

4.2 Recreated Test Cases

Beat input recreation affirmed precise control calculations.
Transfer activated expeditiously on tall stack.
SMS sent inside 2 minutes through Twilio.

4.3 Yield SMS Case



CONCLUSION

5.1 Preferences

Real-time vitality checking
Programmed stack cut-off
SMS alarms by means of Twilio
Moo fetched and versatile
Simple to introduce

5.2 Drawbacks

Web subordinate
Constrained stack (standard 10A transfers)
SMS fetched (Twilio estimating)
IoT security vulnerabilities

5.3 Future Scope

Versatile app integration
Cloud logging with Firebase
Voice right hand control (Google/Alexa)
Multi-load administration
Sun powered optimization
Charging expectation
UPS-based alarming on control disappointment

5.4 Last Words

The Stack Calculation and Assurance Gadget bridges the hole between reasonableness and shrewd vitality assurance. With basic components and cloud integration, it guarantees security and mindfulness, contributing to long haul of shrewd homes and businesses.

Project Image :-