



RF Smart Power Distribution and Control using PIC Micro Controller.

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ABSTRACT—This paper implementation of smart power distribution through RF communication and PIC Microcontroller. It uses the mechanism of optimizing electricity consumption by the consumers. In this three main units are there. units namely, i) Office Unit, ii) Street Panel Unit, iii) Home Unit. EB Office unit controls the street panel unit and it is interfaced through RF wireless communication for sharing of information. The whole home units have its individual ID's and it is controlled by the street panel unit. Each home unit has digital meter reading in LCD display to display the consumed power and its corresponding value. By using this street panel unit concept, power theft can be avoided. One more concept of Auto power shut down has been implemented in this project, for the specified period of time the power distribution for the specified street panel unit can be switched automatically. The EB meter reading persons can be utilized for other works effectively. The main objective of this work is Smart Power Distribution and control.

Keywords —Smart Power distribution, RF communication, PIC microcontroller, Automation & wireless control.

II. BLOCK DIAGRAM

EB Office Unit:

This office unit connected with PC through RS232 serial port. The power supply block steps down the 240v into 5v and 12v as required. CT Circuit is used as current sensor to measure the flow of current. MAX 232 is used to interface between PC and Microcontroller. In the office unit RF receiver module receives the information from street panel unit[2].

I. INTRODUCTION

From the various reviews, the present day power distribution has many critical factors to implement the existing methods. Nowadays Handlings of power distribution modules are complex to the EB persons. Safety of the EB persons is not considered in the existing methods. Details of power consumption and its cost are unknown to the consumer instantaneously. Manual handlings of power distribution lead into lack of performance. Efficiency of the existing methods is less to meet the present scenario. Costs of the existing implementation techniques are very high. So here in this work we introduce new concept to overcome these problems. This concept uses RF module and PIC16F877A microcontroller. RF module comprise of an RF Transmitter and an RF Receiver. The transmitter / receiver (Tx/Rx) pair operates at a frequency of 434 MHz's. This RF module is often used along with a pair of encoder/decoder[1].

Fig: 1.1. Block Diagram of EB Office Unit

Street Panel Unit:

In this street panel unit the microcontroller has been programmed to control the Home unit through Relays and the Relay Drivers. The CT coil is the Current Transformer



Coil used to calculate the current flow through the line of Home unit and sends the information to the PIC micro controller. This unit is interfaced with EB office unit through RF communication.

III. SOFTWARE:

CCS provides a complete integrated tool suite for develop and debugging embedded applications running on Microchip PIC MCUs. The heart of this development tool suite is the CCS intelligent code optimizing C compiler which free developers to concentrate on design functionality instead of having become an MCU architecture expert. Proteus ISIS schematic Capture, PIC C Compiler, DotNet Front end [4].[4]

IV.HARDWARE

The following hardware components are used in this work PIC16F877A Microcontroller, Power supplies, RF Transmitter & Receiver, Encoder & Decoder, Relay, LCD 2 X 16, and MAX232.

V. IMODULE AND AUTOMATIONMODULE

The following figure shows the proposed Street Panel Unit which is interfaced with Office Unit through RF communication and with Home Unit through sealed power line cables [5].

Fig: 1.2. Block Diagram of Street Panel Unit

Home Unit:

In this Home Unit the Microcontroller is used to get the information of Power consumed by the user. This Home Unit microcontroller is connected with the 2X16 LCD to display the amount of power consumption and its corresponding price [3].

Fig: 1.1. Block Diagram of Home UnitUnit.

Fig: 5.1. Street Panel Unit's PCB Module



project results in the smart distribution of power handling technique.

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Objective of this project is Automation of Power Distribution and control using RF Communication and PIC Microcontroller. Meter reading is calculated exactly for the time mentioned by the electricity board. The EB meter reading persons can be utilized for other works effectively. Automation of power distribution helps in human resource management. Concept of Auto power shut down has been implemented in this project. For the specified period of time the power distribution for the specified street panel unit can be switched automatically.

Handlings of power distribution modules are simplest to the EB persons. Safety of the EB persons is much ensured in this smart distribution. Details of power consumption and its cost are known to the consumer instantly from the LCD display of meter. Performance and efficiency of power distribution management has been enhanced in general. Hence this