**PREPAID ENERGY METER USING SMARTCARD TECHNOLOGY**

**AIM:**

This paper discusses the design and development of microcontroller based prepaid energy meter with serial data transmission. The system which is developed is more useful to the customer as he can monitor his energy consumption and can plan accordingly to reduce his consumption as per his budget.

**PURPOSE:**

The purpose of this project is to overcome the drawbacks of normal electricity bill payment system and to implement a new prepaid energy meter system which has high reliability and security using SMART card technology.

**METER SECTION**

**MICRO CONTROLLER**

**POWER SUPPLY**

**ENERGY METER**

**RELAY**

**ELECTRICAL**

**APPLIANCE**

**LCD**

**OPTO**

**COUPLER**

**POWER SUPPLY**

**SMART CARD READER**

**RS**

**232**

**KEY PAD**

**WATER PUMP**

**Power Supply:**

**Regulator section**

**Filter**

**Circuit**

**Bridge**

**Rectifier**

 **Step Down**

**Transformer**

**Description:**

The conventional Electrical billing system where the Electric Power bill given at the end of the month can be paid at Power distribution offices or at e-seva centers. This billing system is quite time consuming and even expensive (in issuing bills at door to door). This traditional Electrical billing system can be replaced with Prepaid Electricity billing system. This Prepaid billing system is based on Smart Card technology.

A smart card is used as an energy card just as a Sim card in mobiles. Before using this card we have to recharge it. Whenever we want to use the power then we have to place this card in the card reader, which is interfaced to the microcontroller with the serial interfacing. The microcontroller reads the data from the smartcard reader and asks how many KWh you require, which is displayed on the LCD display.

Another advantage of this project is that we (electricity department) can overcome the illegal power consumption due to the theft identification system. If any one tries to remove the smart card and tries to connect the supply directly, then the theft identification circuit identifies it and do not supply the power. By this we can save the power by illegal consumption. This is the main advantage of this project with the theft circuit and to save power.

**TECHNOLOGY:**

Smart cards are secure tokens that have provided security services to a wide range of applications for over thirty years. Along with other technology advances, smart card technology has changed dramatically as well. For nearly a decade, researchers have sought to connect smart cards to the Internet. The benefits are more including providing services over the Internet and eliminating smart card specific infrastructure.

A smart card is an integrated circuit card that forms a part of a circuit or system when engaged with a smart card interface. Smart cards are becoming increasingly more popular for security and personal identification applications. Smart cards have one or more microcontrollers embedded in them which manage access to, and storage of, sensitive data that is actually stored in memory devices on the smart card. The smart chip included on a smart card provides a means for secured electronic transactions and a means for identification. The integrated chip is embedded in the smart card and operates to process specific transactions. The smart card uses a serial interface and receives its power from an external source such as a smart card reader.

**SOFTWARES:**

1. Embedded C
2. Keil IDE
3. Uc-Flash or ISP

**HARDWARES:**

1. Micro Controller
2. Power Supply
3. SMART CARD Reader
4. Energy Meter
5. RS -232
6. Optocoupler
7. Relay
8. Keypad
9. LCD
10. EEPROM

**ADVANTAGES:**

1. Provides security
2. Saves time
3. Highly reliable

**RESULT:**

With the help of this project we had implemented aPrepaid electricity billing system like prepaid cell phone recharge system for paying electricity bills which provides a high level security and saves a lots of time.