

## How Electronic Energy Meter Works?

The conventional mechanical energy meter is based on the phenomenon of “*Magnetic Induction*”. It has a rotating Aluminium Wheel called *Ferriwheel* and many toothed wheels. Based on the flow of current, the *Ferriwheel* rotates which makes rotation of other wheels. This will be converted into corresponding measurements in the display section. Since many mechanical parts are involved, mechanical defects and breakdown are common. More over chances of manipulation and current theft will be higher.

Electronic Energy Meter is based on *Digital Micro Technology (DMT)* and uses no moving parts. So the EEM is known as “*Static Energy Meter*” In EEM the accurate functioning is controlled by a specially designed IC called ASIC (Application Specified Integrated Circuit). ASIC is constructed only for specific applications using Embedded System Technology. Similar ASIC are now used in Washing Machines, Air Conditioners, Automobiles, Digital Camera etc.

In addition to ASIC, analogue circuits, Voltage transformer, Current transformer etc are also present in EEM to “*Sample*” current and voltage. The ‘*Input Data*’ (Voltage) is compared with a programmed “*Reference Data*’ (Voltage) and finally a ‘*Voltage Rate*’ will be given to the output. This output is then converted into ‘*Digital Data*’ by the *AD Converters* (Analogue- Digital converter) present in the ASIC. The Digital Data is then converted into an “*Average Value*”. Average Value / Mean Value is the measuring unit of power.

The output of ASIC is available as “*Pulses*” indicated by the LED (Light Emitting Diode) placed on the front panel of EEM. These pulses are equal to Average Kilo Watt Hour (kWh / unit). Different ASIC with various kWh are used in different makes of EEMs. But usually 800 to 3600 pulses / kWh generating ASIC s are used in EEMs. Most of the EEMs installed by KSEB have out pulses of 3200 / kWh. The output of ASIC is sufficient to drive a Stepper Motor to give display through the rotation of digits embossed wheels. The output pulses are indicated through LED. The ASIC are manufactured by Analogue Device Company. ADE 7757 IC is generally used in many countries to make EEMs. ADE 7555 / 7755 ASIC maintains the international standard CLASS I IEC 687/ 1036.