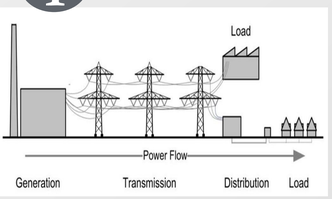
Circuit Breaker with Reclocer

1 Electrical power system



❖**What is the power system ?**

The power system is a network which consists generation, distribution and transmission system. It uses the form of energy and converts it into electrical energy.

2 *Power system protection*

❖**What is the Power system protection ?**

is a branch of electrical power engineering that deals with the protection of electrical power systems from faults through the disconnection of faulted parts from the rest of the electrical network.

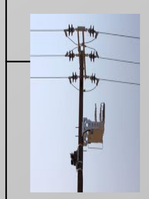
❖**Component of protection Devises :**

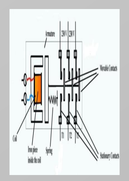
❖Relays.
❖Circuit breakers
❖Recloser
❖Contactors

3 *Recloser*

Automatic Circuit Recloser. A self-controlled device for automatically interrupting and reclosing an alternating-current circuit, with a predetermined sequence of opening and reclosing followed by resetting, hold closed, or lockout.

Reclosers are small circuit breakers located at the top of distribution poles and are typically used on very long distribution feeders. Their function is to isolate a section of the feeder in fault or overload conditions and thereby minimize the number of customers without service. Since they act as small circuit breakers, they have the capability to restore power automatically in temporary fault situations, hence the name "recloser".

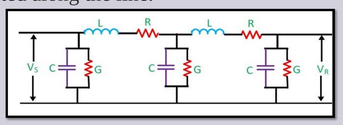




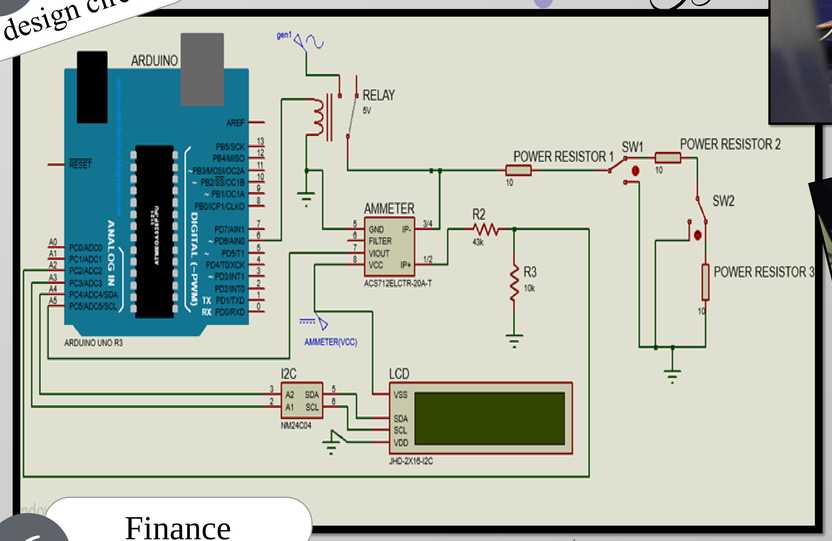
4 *Transmission line:*

A transmission line is used for the transmission of electrical power from generating substation to the various distribution units. It transmits the wave of voltage and current from one end to another. The transmission line is made up of a conductor having a uniform cross-section along the line

❖The performance of transmission line depends on the parameters of the line. The transmission line has mainly four parameters, **resistance, inductance, capacitance and shunt conductance.** These parameters are uniformly distributed along the line.



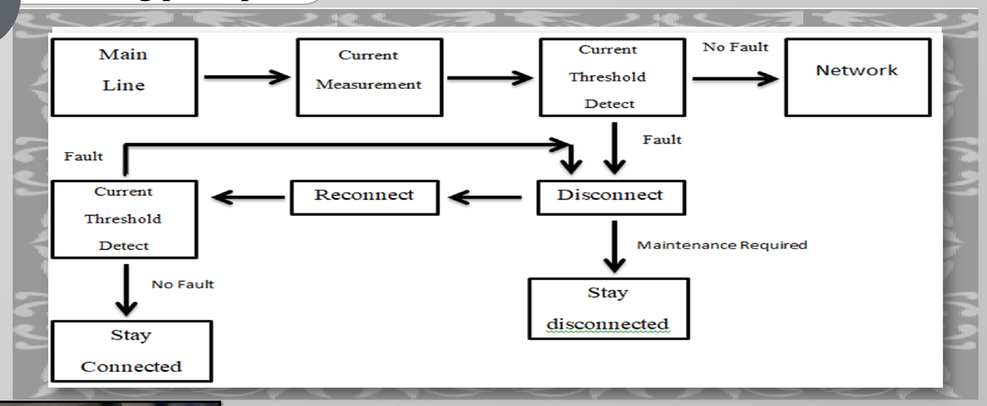
5 Our design circuit



6 Finance

Unit Details	Unit Price	Units Quantity	Price
10mm² Copper Cable, 600V rated	4 ₪ (per meter)	1.5 meters	6 ₪
10mm2 Cable shoe	2.5 ₪ (per unit)	6 units	15 ₪
Terminal Block Connector with 10mm2 Rated Section	4 ₪ (per unit)	6 units	24 ₪
Electromagnet(Coil), 230V and 1.3A rated	40 ₪ (per unit)	1 units	40 ₪
Copper Connector, 450V and 125A rated	15 ₪ (per unit)	4 units	60 ₪
Magnetization Cores	10 ₪ (per unit)	2 units	20 ₪
Arduino Uno R3	25 ₪ (per unit)	1 unit	₪ 25
PZEM-004T sensor	₪ 30 (per unit)	1 unit	30 ₪
Switch	20 ₪ (per unit)	2 unit	40 ₪
Power Resistor 10Ω	10 ₪ (per unit)	3 unit	30 ₪
5V Relay, 10A rated	13 ₪ (per unit)	1 unit	10 ₪
20*4 LCD Screen for Arduino	40 ₪ (per unit)	1 unit	4₪ 0
White Board	10 ₪ (per unit)	1 unit	₪ 10
Metal body	3.4 ₪ (per kilogram)	20 kilograms	70 ₪
Total Cost			₪ 420

7 Working principle



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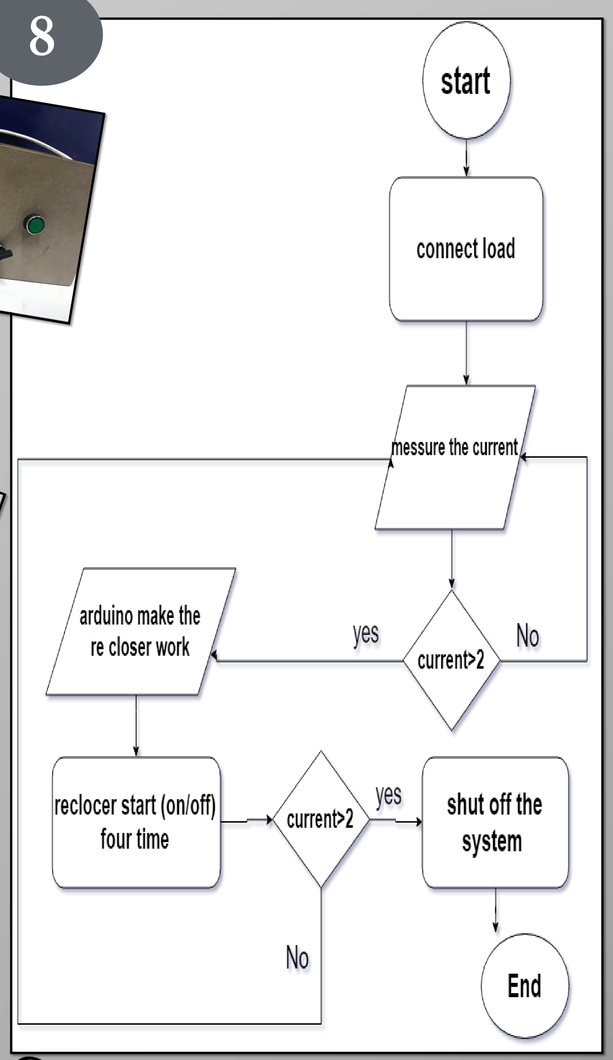

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Conclusion :

In this project we able to construct a functional smart recloser prototype, the experiments we did introduced many important fields to be taken care of the protection mythology, for example the fast measuring of parameters in feeder, will help the recloser trip faster and will protect the network from sudden change in current and voltage, also we learned the safety procedures and precautions to be taken while using a high voltage source.

As we show in chapter five, our device provide high speed of controlling and measuring according to the fast microcontroller, which is help us to implement our multi-functional device .

We make a prototype for a transmission line to explain a distance relay concept and we preform it with a power resistor as a transmission line.

Also we learn from this project what is the transmission line and how to protect it and how to take a safety producer when we work with it .

Our project consist of two related ideas .through which we come to important of transmission line ,how to protect transmission line and how speed of addressing the problem in transmission line can facilitate the proses .

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