BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Department of Electrical and Electronic Engineering

Project Proposal

Course No. : EEE 306
Course Title: Power Systems I Laboratory

Level/Term: 3/1
Section: C2

Name of the Project: **Fault Detection System of Transmission Line**

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❖ Background:

Electrical networks, machines and equipments are often subjected to various types of faults while they are in operation. When a fault occurs, the characteristic values (such as impedance) of the machines may change from existing values to different values till the fault is cleared.

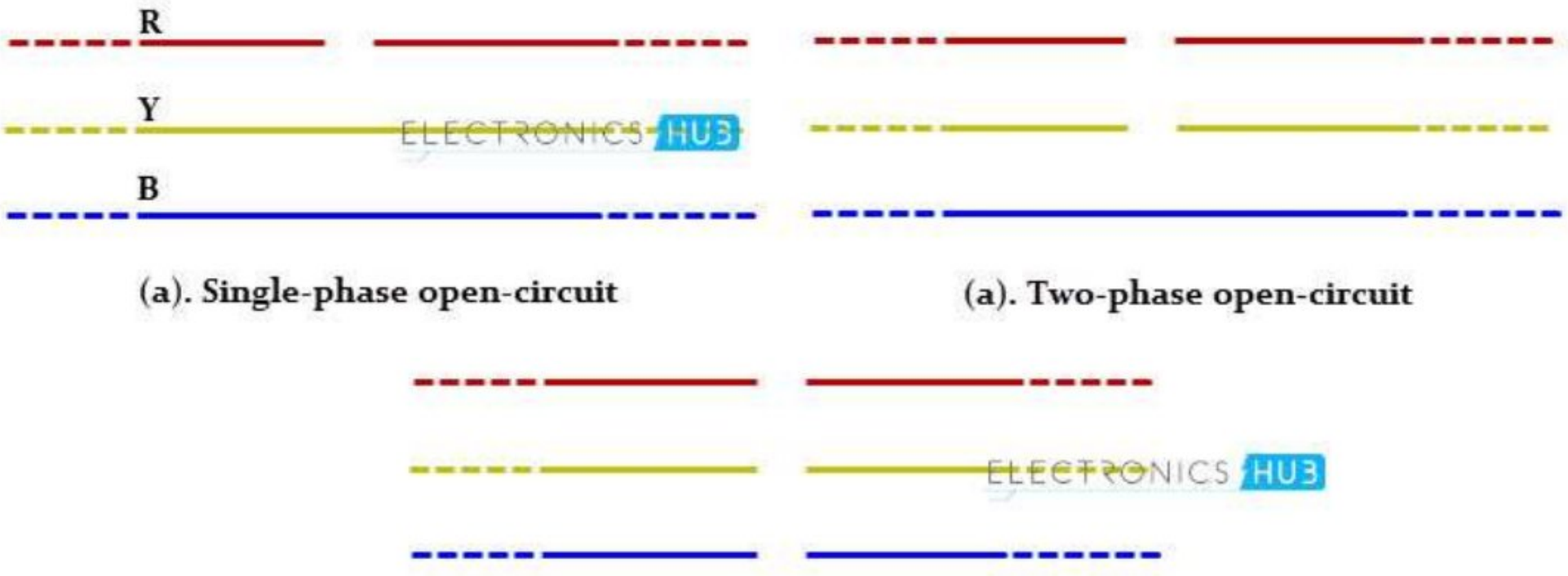
There may be lot of probabilities of faults to appear in the power system network, including lighting, wind, tree falling on lines, apparatus failure, etc.

Electrical faults in three-phase power system mainly classified into two types, namely open and short circuit faults.

Open Circuit Faults:

These faults occur due to the failure of one or more conductors. The figure below illustrates the open circuit faults for single, two and three phases (or conductors) open condition.

Open-circuit Faults



(a). Single-phase open-circuit

(a). Two-phase open-circuit

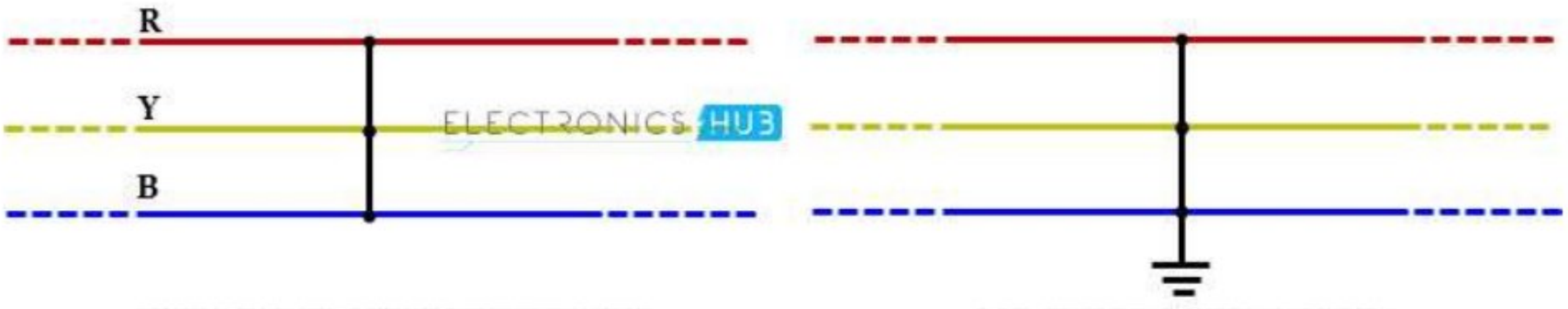
(a). Three-phase open-circuit

Short Circuit Faults:

A short circuit can be defined as an abnormal connection of very low impedance between two points of different potential, whether made intentionally or accidentally.

The various possible short circuit fault conditions include three phase to earth, three phase clear of earth, phase to phase, single phase to earth, two phase to earth and phase to phase plus single phase to earth as shown in figure.

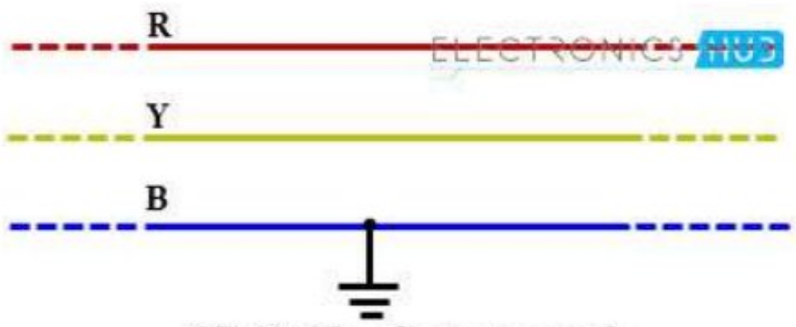
Short-circuit Faults



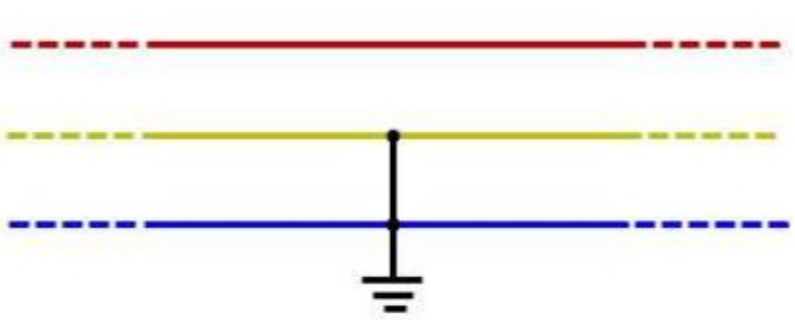
(a). Three-phase clear of earth

(b). Three-phase-to-earth

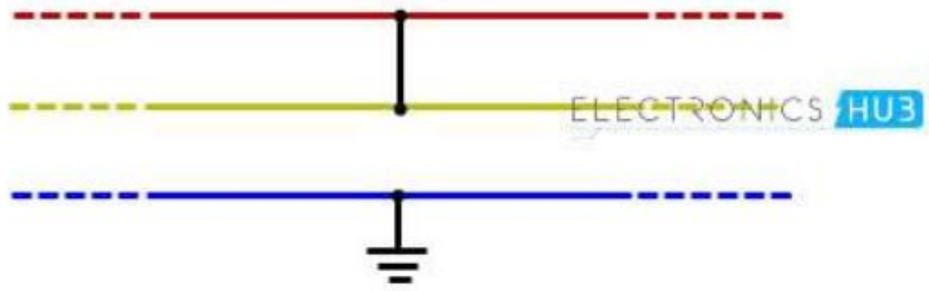
(c). Phase-to-phase



(d). Single-phase-to-earth



(e). Two-phase-to-earth



(f). Phase-to-phase plus single-phase-to-earth

❖ Objectives:

We will develop a hardware-based system using **Arduino** which will be able to perform the following works.

- It will detect the 'Line to Line' and 'Line to Ground' fault in transmission line
- After successful detection of faults, it will allow us to disconnect the power of that area