Elevator Control System

# Scenario

We generally see elevator systems at apartments or office. An elevator control is a distributed real-time system.

The elevator control must control an elevator for a building. It has the basic functions like moving up/down, open/close door and carrying passengers across floors.

This elevator system is fitted in a multistoried building with zero to n (maximum number of floors of the building) floor.

Each elevator should have a set of floor-request buttons corresponding to a desired floor. For every floor except the top and bottom floor there are two elevator request buttons. Every elevator has a Car that moves the traffic. The car should have an emergency button to notify security in case of emergency.

Each elevator has a current floor indicator above the door. Each floor has an indicator showing the floor the elevator is currently at and another indicator for its current direction.

The system should respond to an elevator request by sending the nearest elevator either in idle condition or already moving in the requested direction. If the above-mentioned condition does not meet the request shall pend until one of the elevators meets the condition. When a car reaches a floor where someone is already waiting or somebody inside wants to get down, the car stops, doors get opened and the direction indicator illuminated such that the passengers get to know in which direction the car is moving. The car moves very fast between floors but slows down to stop before reaching the desired floor.

To reinforce safety, each floor is fitted with optical and pressure sensors to prevent closing when an obstacle is in between two door halves. The door shall automatically close after a pre-configured time-out period. In case an obstruction is detected the door, closure timer should reset after the obstruction is removed. The car moves only when both the elevator and floor doors are closed. There are cable tension sensors monitoring the tension on the cable controlling the elevator. In case there is sudden drop measured tension below a configured critical value, external locking clamps connected to the running tracks should stop the elevator and hold it in place. Passengers will also have the ability to start/stop the car during any emergency.