Report on,

Power Window System Using MATLAB-SIMULINK

Submitted by,

Vijay Jagtap(214868)

Abstract:

Automobiles use electronics for control operations such as:

- Opening and closing windows and sunroof
- Adjusting mirrors and headlights
- Locking and unlocking doors

Power assisted door glass is defined as automobile window which can be raised and lowered by depressing a button or switch as opposed to using a hand-turned crank handle.

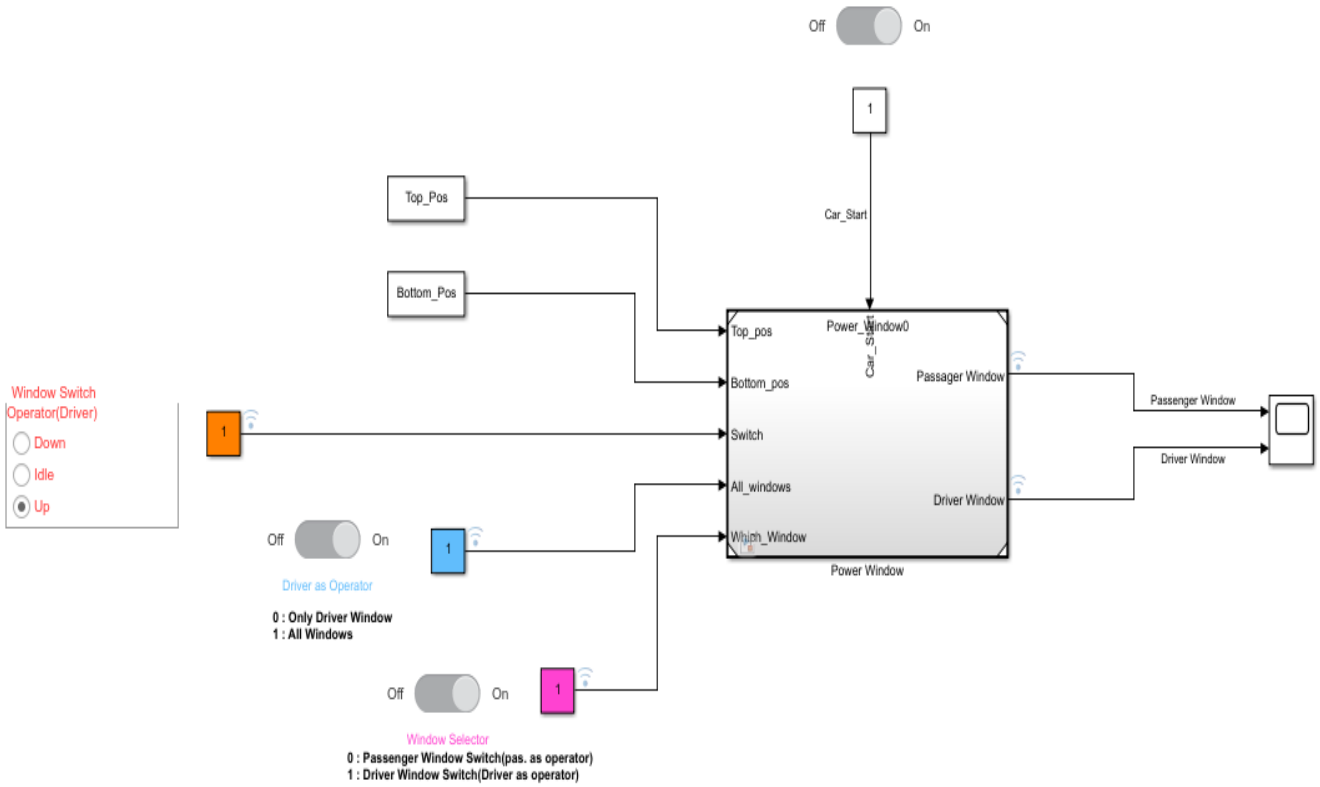
This system is also coined as power window in automotive industry. The power window of a vehicle door window is a device installed between the vehicle door panels and has a simple top level functional requirement. The glass guidance system will raise and drop the window glass with a reasonable speed from the electrical power window motor.

Power windows are usually inoperable when the car is not running. This is primarily a security feature. It would be a simple thing to allow electric power windows to be operable when the ignition is turned off, however it would also make the car much easier to steal. Some systems offer the compromise of leaving power applied to the windows until a passenger door is opened at which time the window power is removed.

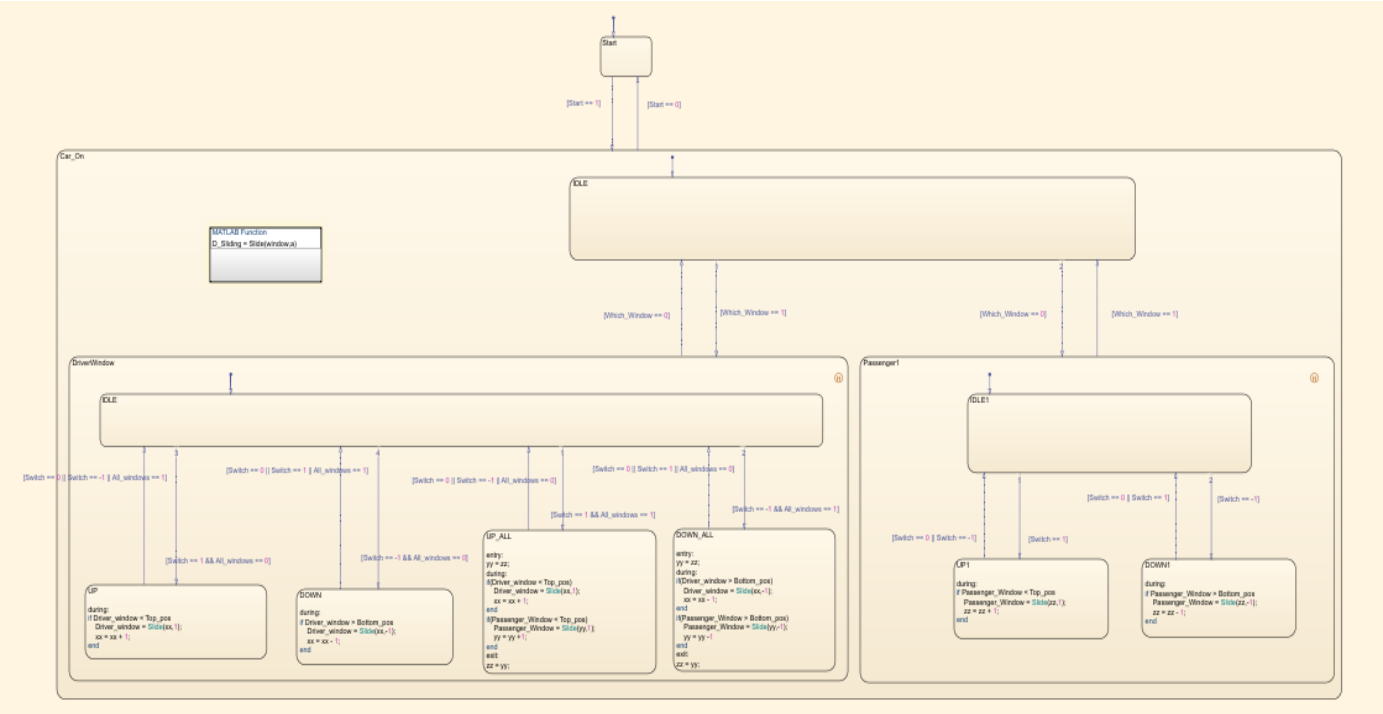
Requirements:

- When car is not start/running, Power window system will not work.
- When window operator switch is in ‘Idle’ state, no any window will operate.
- When window operator switch is in ‘Up state, particular window should move upward until its maximum position.
- When window operator switch is in ‘Down state, particular window should move downward until its maximum position.
- When Driver switch is in ‘All-Windows’ mode, Driver as well as passenger’s window should operate respectively.
- When driver switch is in ‘driver-only’ mode, only driver’s window should operate respectively.
- When passenger window switch is used, only that particular window of the passenger should operate.

Simulink Model:



Stateflow Chart:



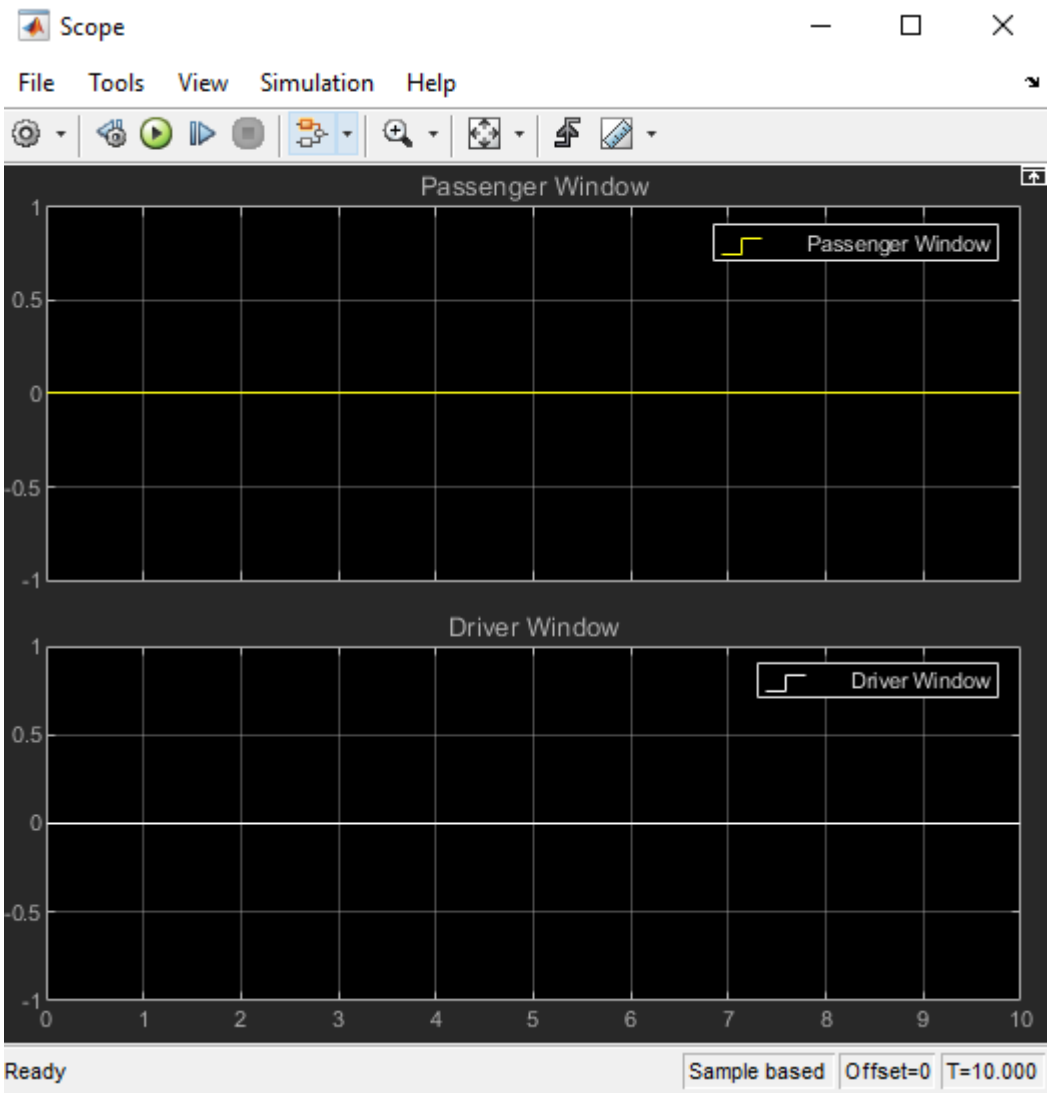
Matlab Function to Control Sliding of window:

```
function D_Sliding = Slide(window,a)
if a == -1
D_Sliding = window - 1;
end
if (a == 1)
D_Sliding = window + 1;
end
```

Results:

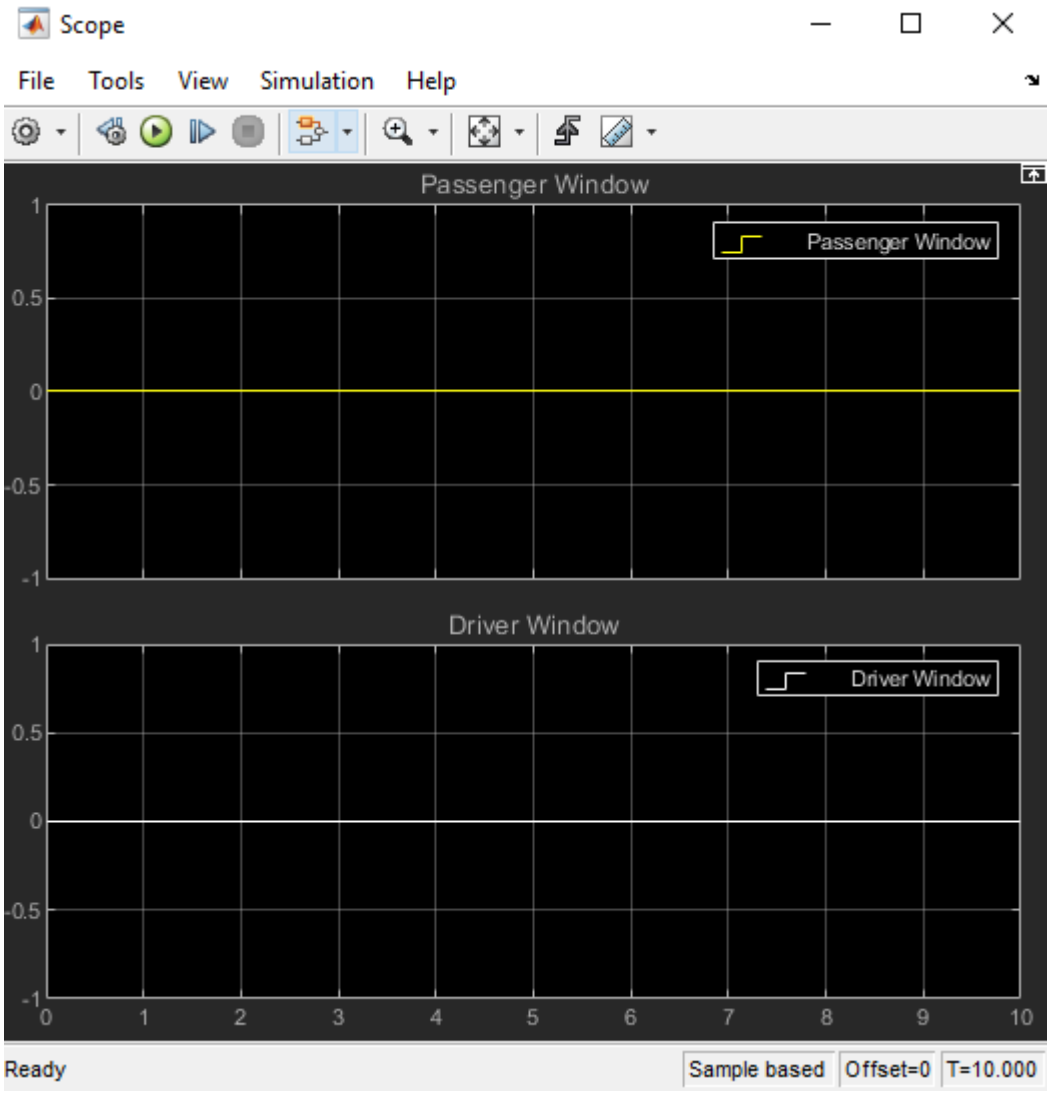
1. Stop Mode:

(No any window will work)



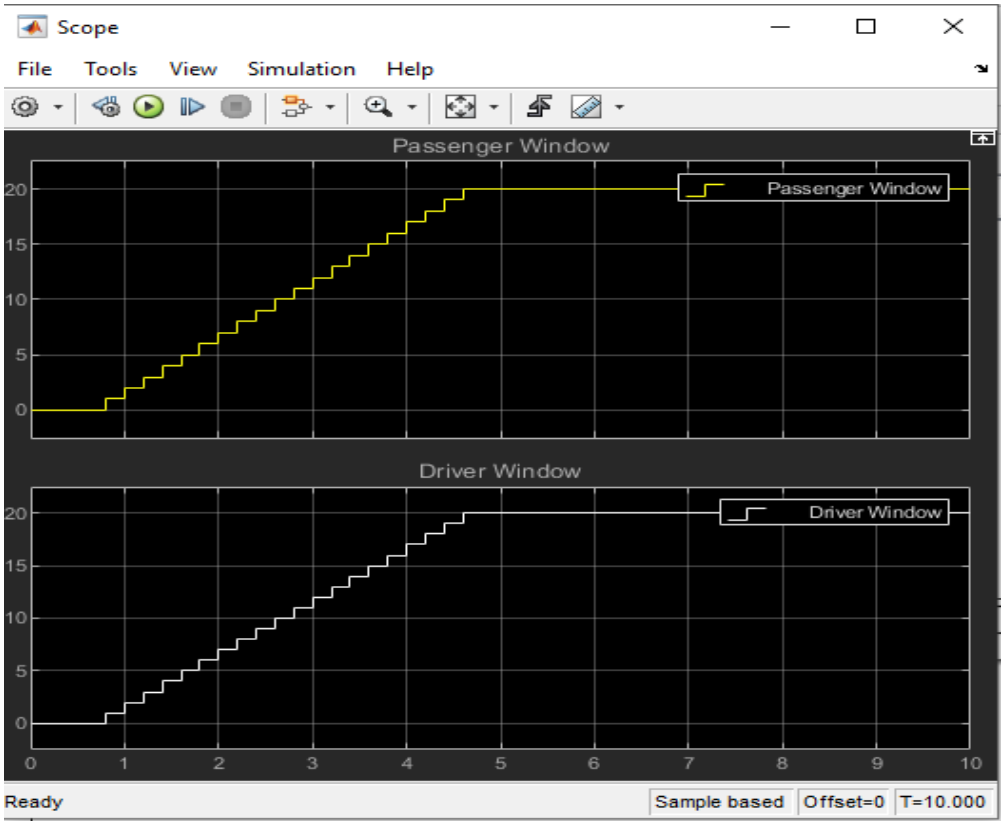
2. “Start + Idle” Mode:

(All windows act as neutral state)

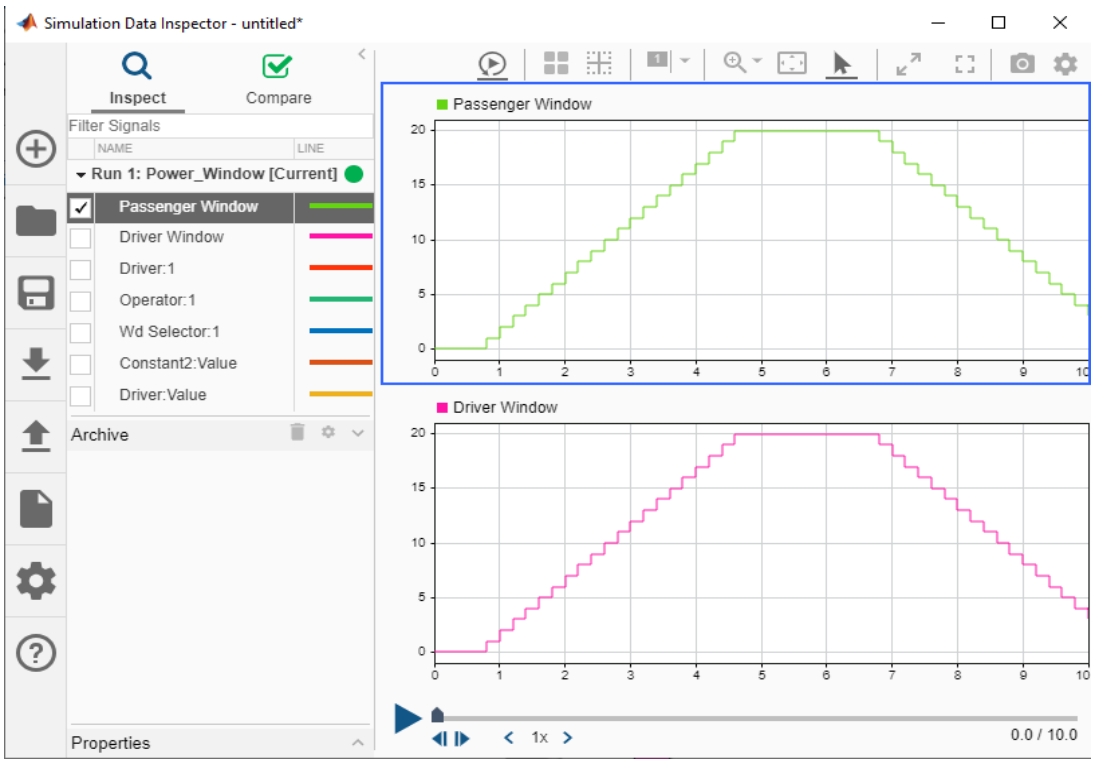


3. “Start + Up + All_Window” Mode:

(All windows will move to upward direction)

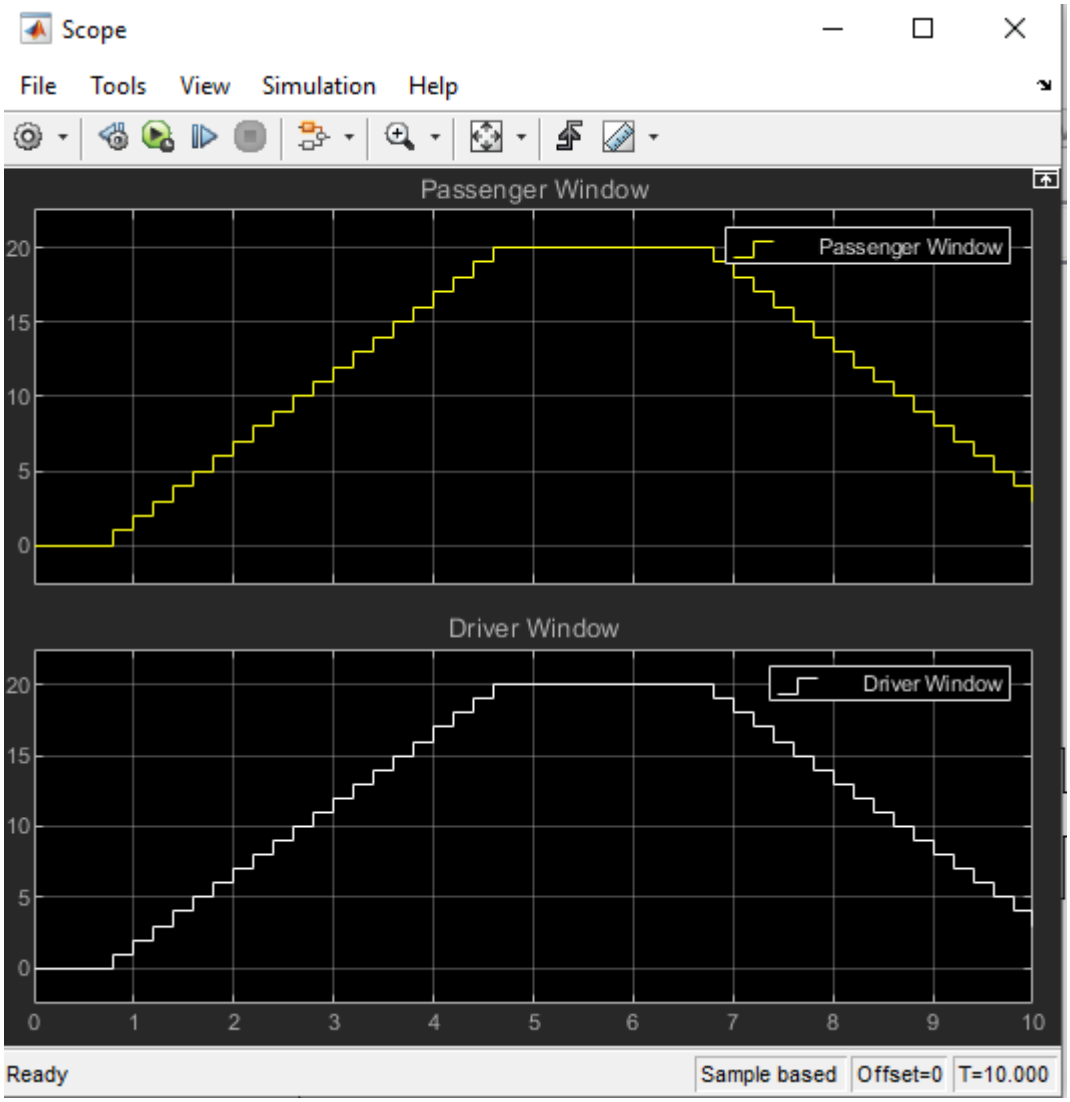


Result on Data Inspector:



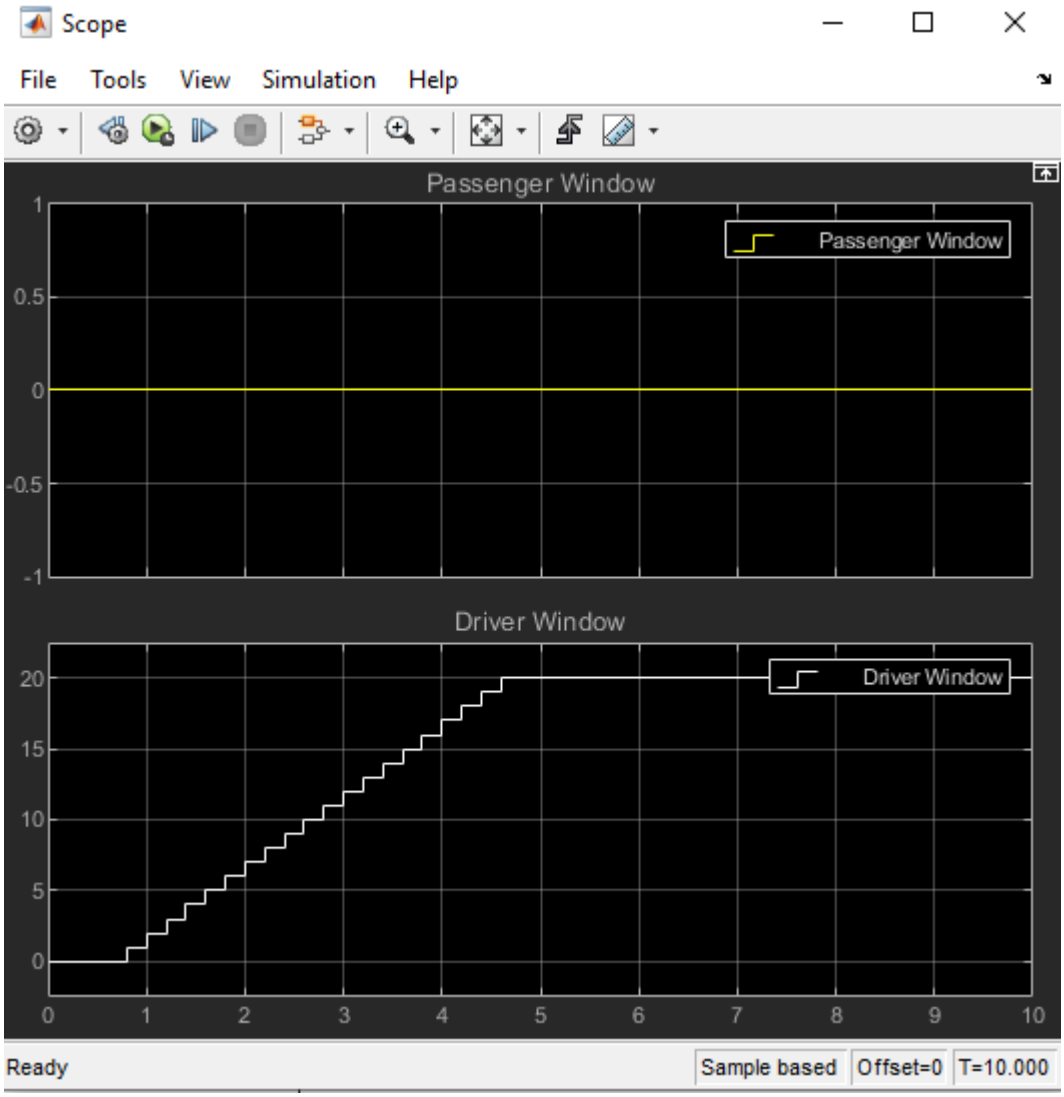
4. “Start + Down + All_Window” Mode:

(All windows will move to downward direction)



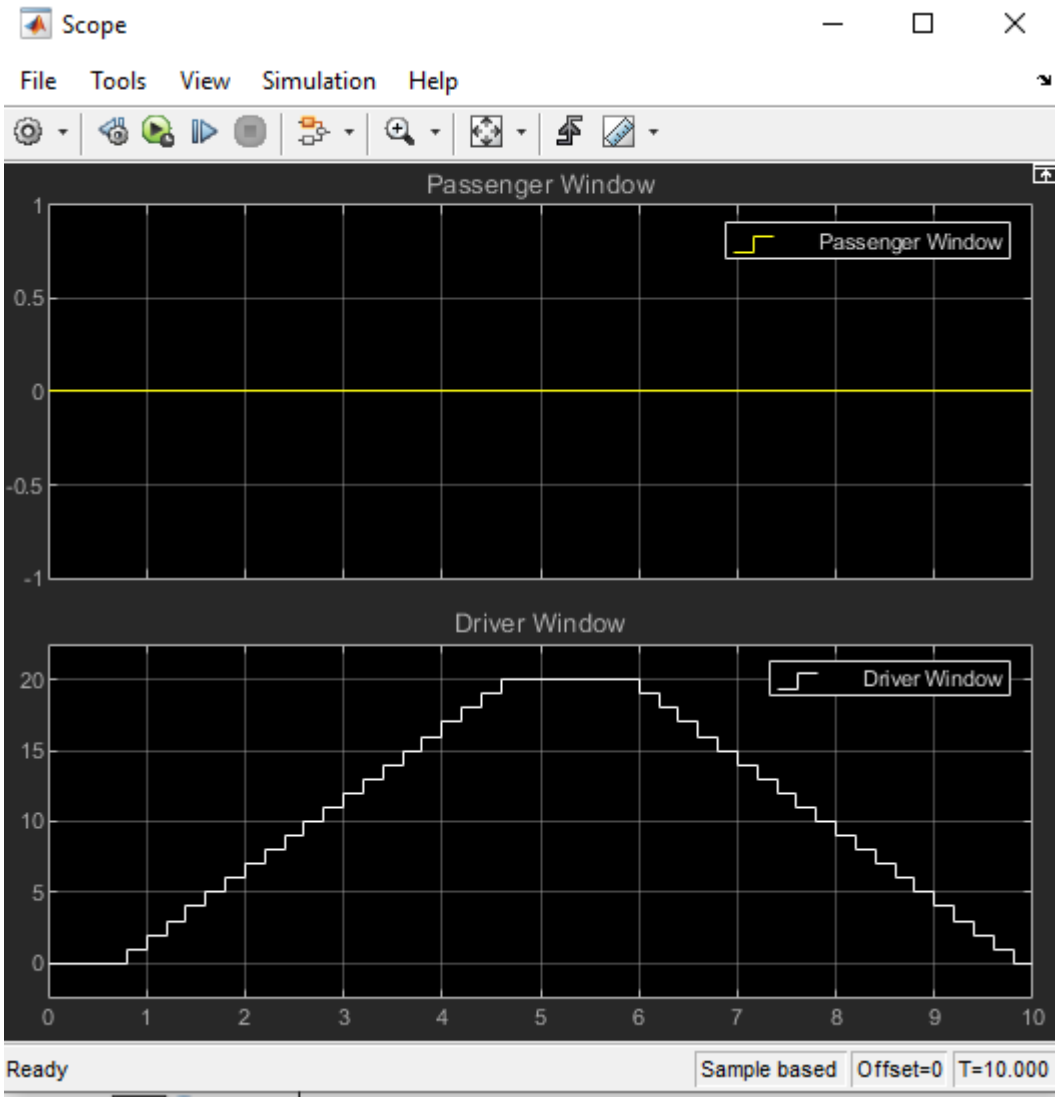
5. “Start + Up + Only_Driver” Mode:

(Only driver window will move to upward direction)



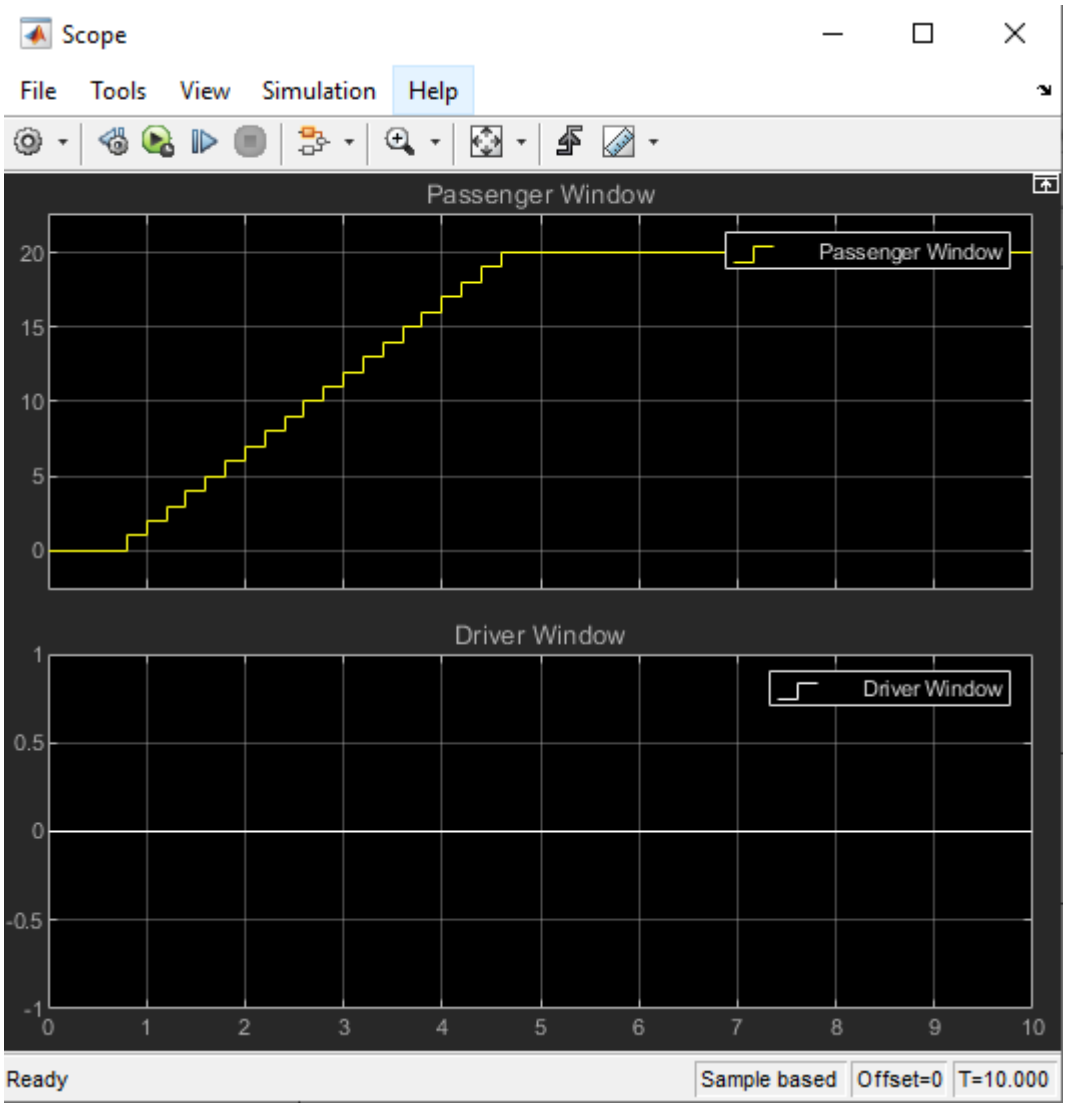
6. “Start + Down + Only_Driver” Mode:

(Only driver window will move to downward direction)



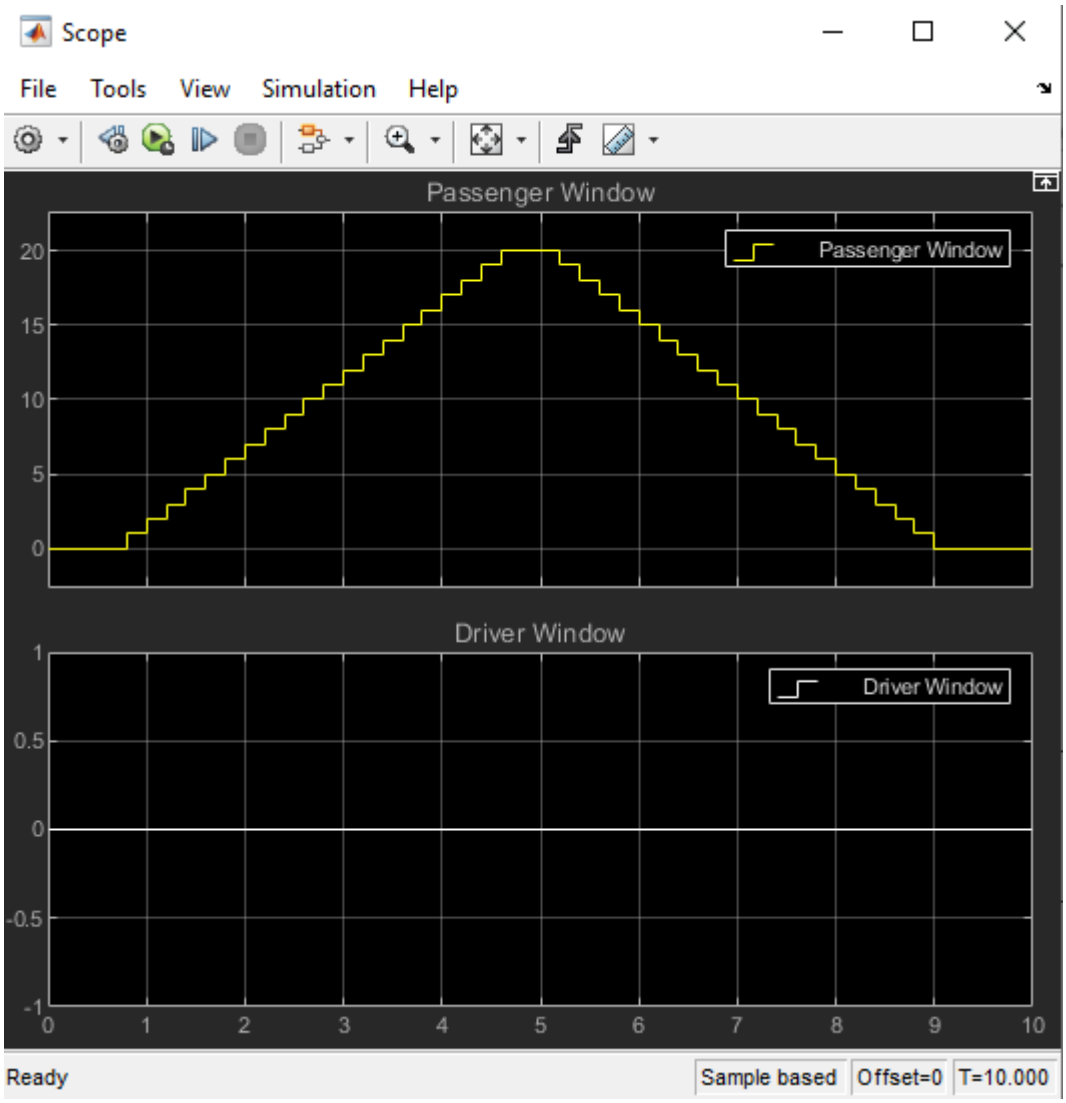
7. “Start + Up + Only_Passenger” Mode:

(Only passenger window will move to upward direction)



8. “Start + Down + Only_Passenger” Mode:

(Only passenger window will move to downward direction)



Conclusion:

The simulation model presented in the report is a MATLAB/Simulink based system that enhances the safety and comfort with respect to power window. The automobile vehicles are enhancing day by day and Engine Control Unit (ECUs) is one the major part of automobile. The proposed automatic window will be great extent solution to the automobile industries to enhance its efficiency and faster response time.