

PROTOTYPING ENVIRONMENT FOR CLIMATE CONTROL DEVELOPMENT

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INTRODUCTION

- Why is climate control necessary?

User Interface



Chevrolet Volt



OBJECTIVES/DESIGN SPEC

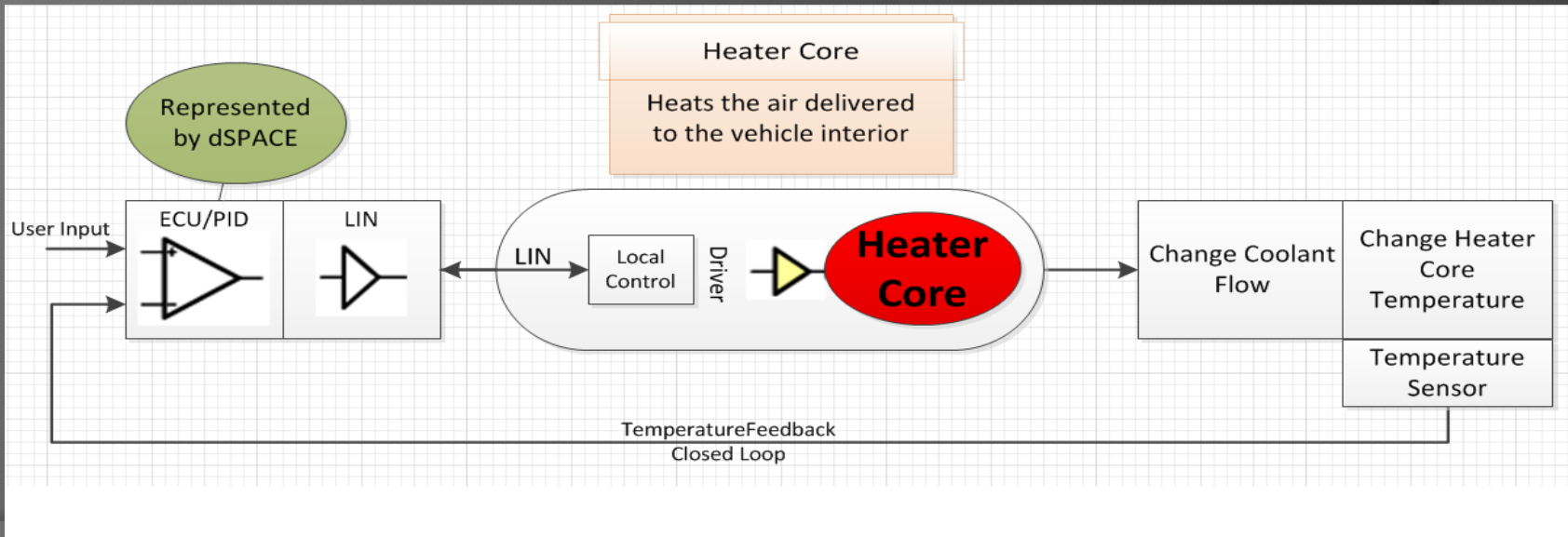
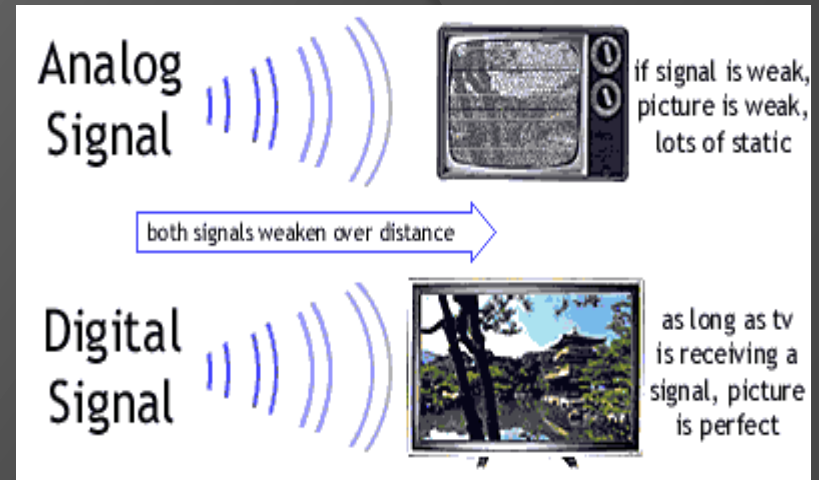
To accomplish climate control development, the following specs must be met:

- Use dSPACE to:
 - implement a LIN handler
 - read various climate control sensors
 - drive multiple LIN actuators
- Wire and demonstrate LIN device and sensor functionality using the dSPACE system.
- Allow the customer to modify our driver design for reusability.
- Document our design



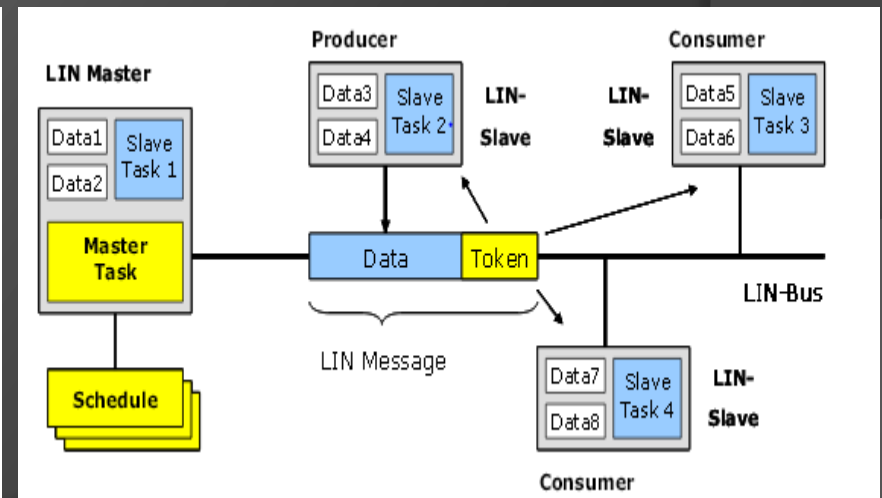
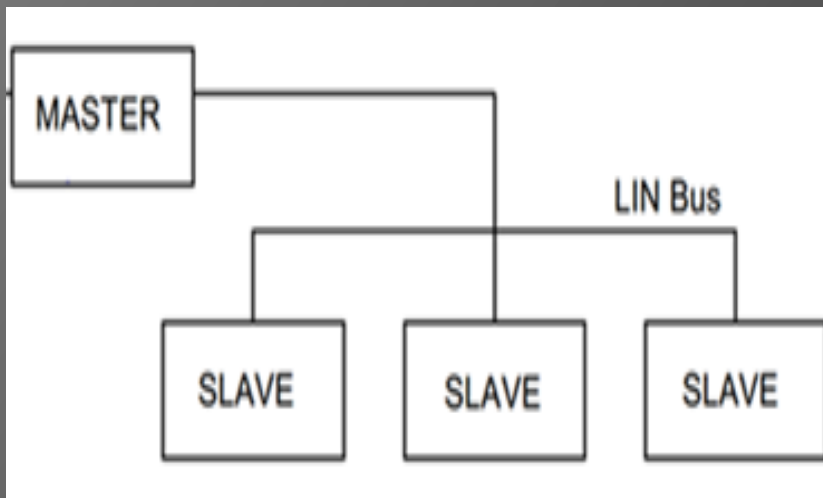
BACKGROUND

- Why is digital communication better than analog?
- What GM requires for the future of climate control
- What we are doing to fix the problem



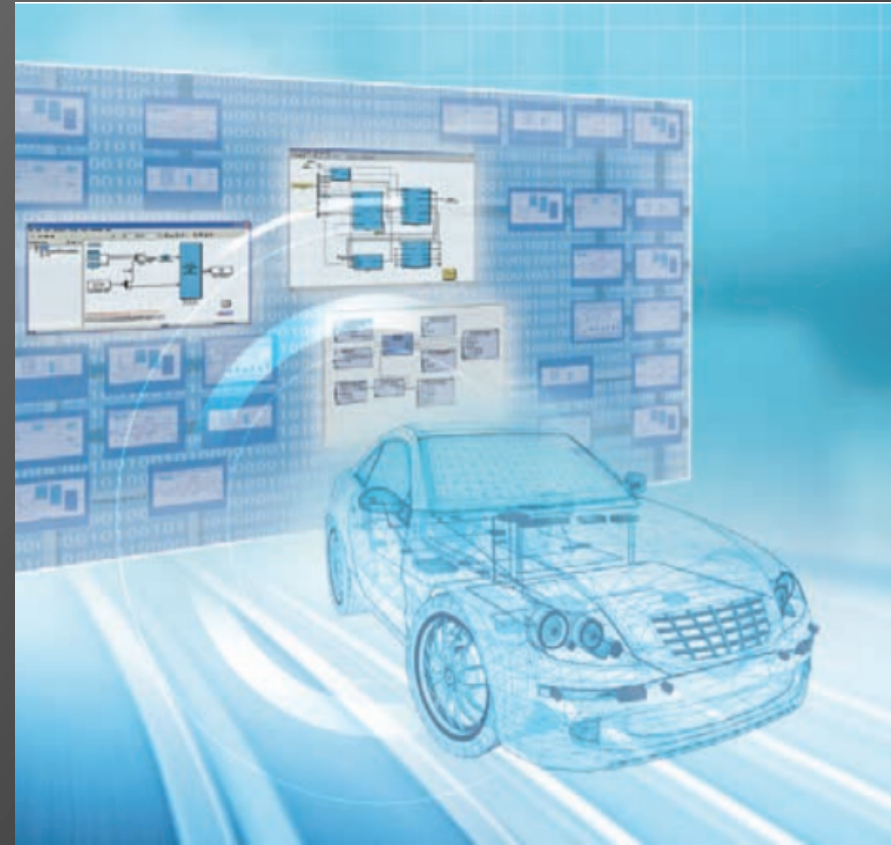
LIN NETWORK OVERVIEW

- LIN is a sub-bus system based on a serial communications protocol
- LIN reduces cost by reducing the amount of wires handled, and components can be driven without crystal or ceramic resonators.
- LIN also permits auto-correction in transmission and reception of data.



dSPACE

- Capture items in any format
- Support all the development phases
- Easy access to the materials
- Preserves our digital work over the long term
- Save on time and cost of prototyping



ACTUATORS/SENSORS

- Actuators
 - Air Inlet
 - Air Delivery
 - Temperature Blend Flaps
 - Blower Motor
 - Evaporator
 - Heater Core
- Sensors
 - Rain, Light, Humidity sensor
 - Solar Sensor



ACTUATORS/SENSORS CONT.



Solar Sensor

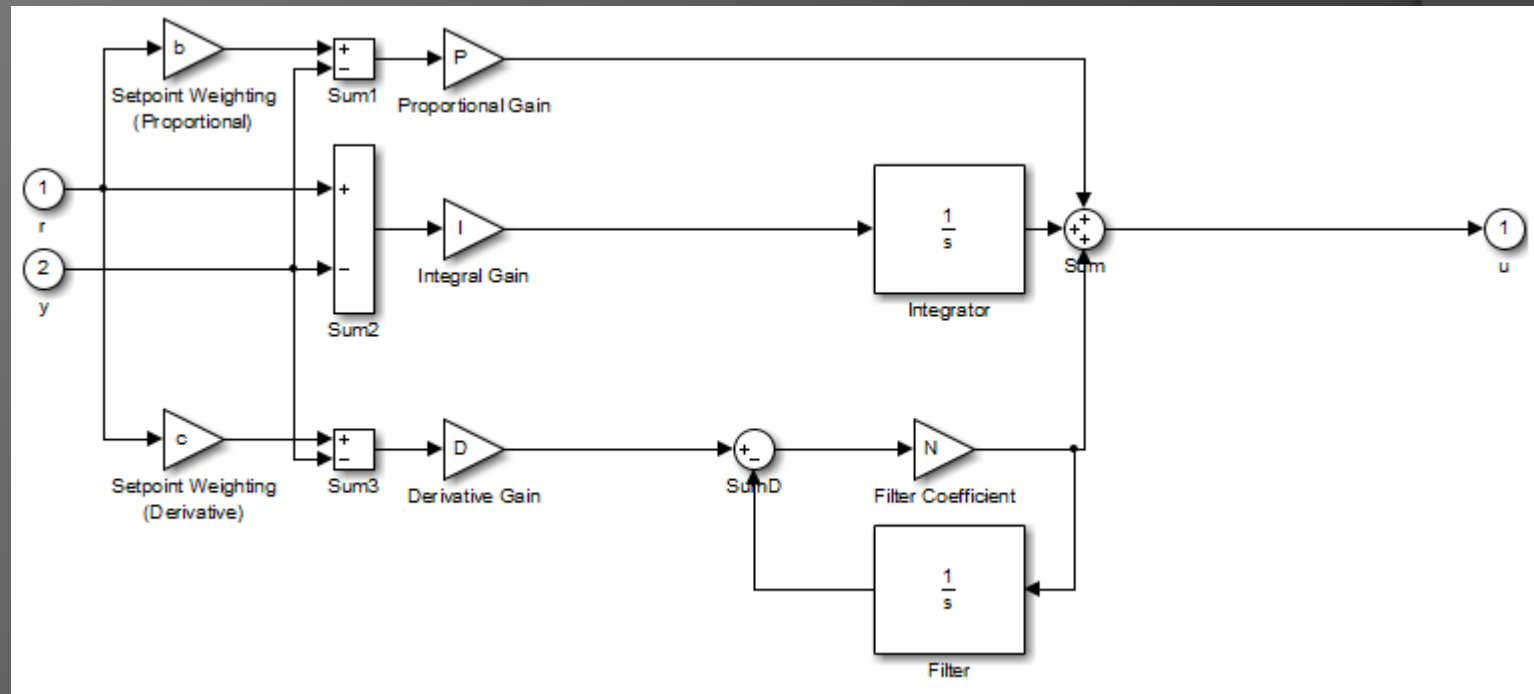


Rain Light Humidity Sensor (RLHS)

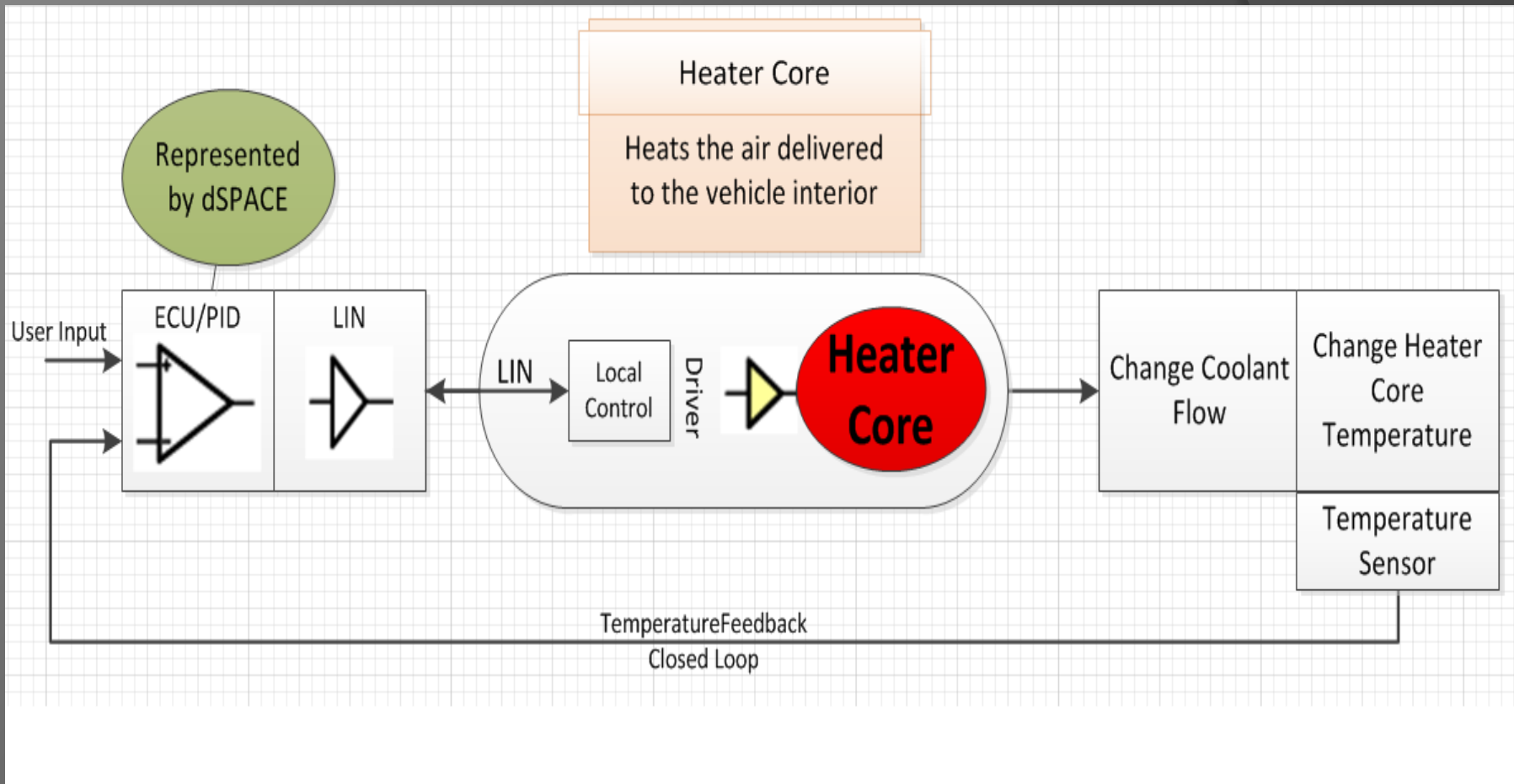
CONTROLLER DESIGNS

- Proportional Integral (PI)
- Proportional Derivative (PD)
- Proportional-Integral-Derivative (PID)

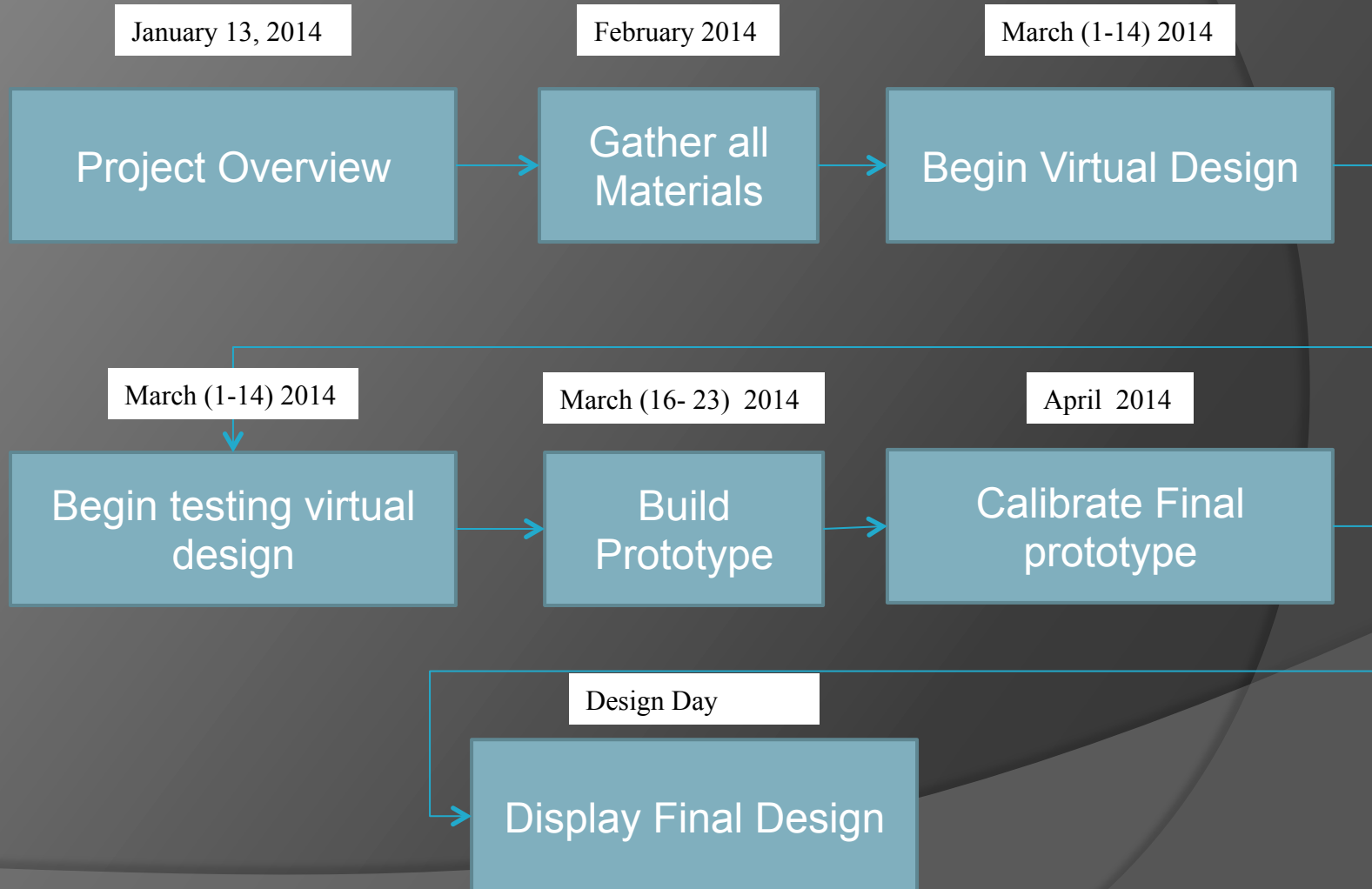
PID Controller Simulink Diagram



CONTROLLER DESIGNS CONT.



Project Timeline Projections



QUESTIONS??????

