

# **Automated Industrial Wind Tunnel Functional Requirements**

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The overall purpose of this project is to allow for a wind tunnel to be monitored and controlled remotely via the Internet. The wind speed can be modified via a blower and a damper while the position of the target object inside the wind tunnel can be modified via two linear actuators. The wind speed and position of the target should be modified either by the existing manual controls (switches) or via an existing 8051F120 microcontroller unit. The command signals should be delivered to the MCU via a serial connection from a PC located in the laboratory. This PC will also be set up as a server which can be controlled either by a local user or through a remote client. This project is a continuation of previous senior projects and most of the hardware needed has already been purchased.

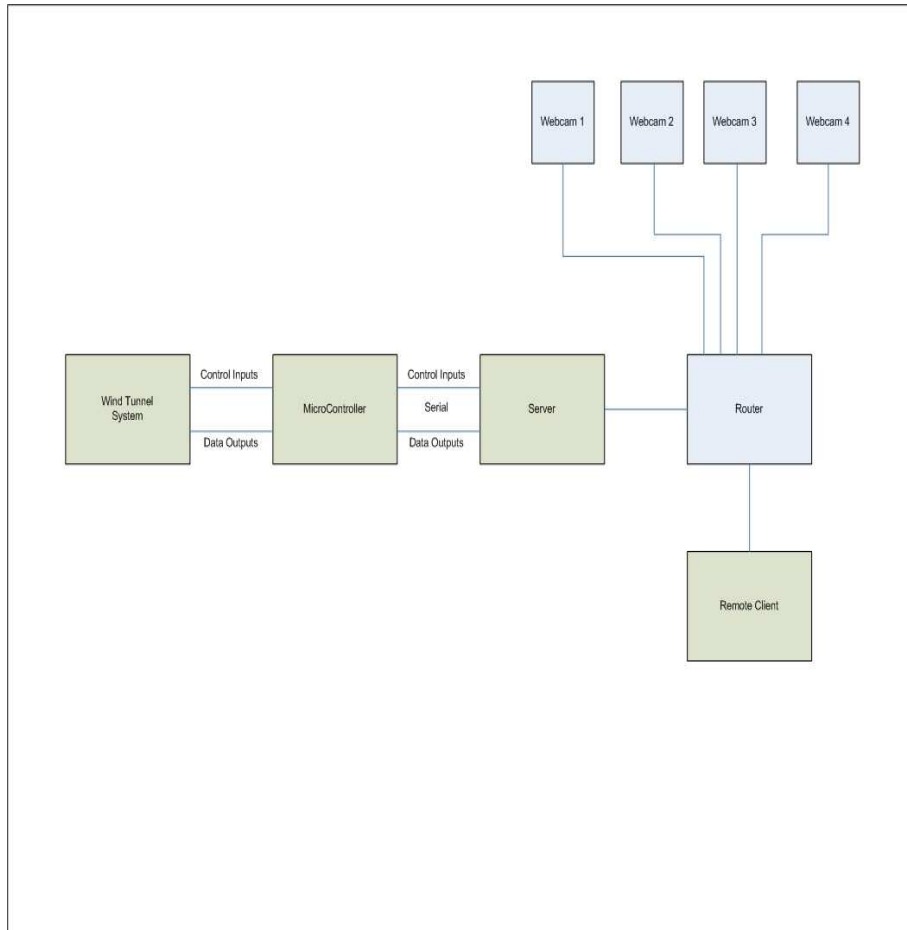


Figure 1 – System Block Diagram

Specifications:

- Sensor data from the lift/drag sensors and the potentiometers in the actuators shall be sent by the microcontroller every 10 ms.
- Actuator position change shall take no longer than 10 seconds.
- The microcontroller shall be able to store up to 10 commands before ignoring further inputs.
- The wind tunnel shall be able to be controlled remotely via the microcontroller or locally by manual controls.
- The remote control system shall allow multiple users to view and collect data, while one user can control the actions of the wind tunnel.

Referenced Materials:

Silicon Labs DataSheet for C8051F120

<https://www.silabs.com/Support%20Documents/TechnicalDocs/C8051F12x-13x.pdf>

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