Microcontroller driven Display 3 System Block Diagram

by

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**Introduction**
This system is to gather data from the Mechanic Engineering Department’s formula car and display it in a useful manner on a LCD screen. To accomplish this task, two approaches are being investigated. Approach 1 makes use of the available Engine Control Module (ECM) to gather data that is then communicated to a microcontroller via a serial data link. This is shown in figure 1, and is the preferred method. Approach 2 will have the microcontroller gather data from individual sensors directly, and is shown in figure 2. In either approach, after the data is available to the microcontroller it will analyze and convert the data into a useful form and send it out to a LCD driver.

**Hardware Functional Description**
Independent of the driver chip chosen, the RAM and LCD screen will be required. The RAM allows the driver to store data between screen refreshes so the microcontroller doesn’t have to resupply it. The driver chip being considered provides several additional features beyond those provided by standard driver chips. The chip allows for screens to be predesigned on a computer and stored on a serial flash chip that the driver combines with the data from the micro controller for display. This driver also has built in capabilities to handle data from a touch screen that it can use for small changes in the display format, or forward information back to the microcontroller for more detailed action.

![Figure 1 – Components and data flow of system with Approach 1 that uses ECM.](image-url)
Software Functional Description

Figure 3 shows the preliminary concept of the code. The main program provides system initialization, and once that has been completed is no longer required. The interrupts do the majority of the work, gathering data and sending it to the LCD controller. As this is expected to require a significant portion of the time devoted to the overall project the functional description is expected to grow and become more detailed during the project.

Figure 2 – Components and data flow of system with Approach 2 that uses individual sensors to gather data.
Figure 3 – Top level code flow chart (preliminary)