

CLIENT

The client is one of the worlds leading Auto Components manufacturer, based in USA

Actuator Control Machine Card (ACMC)



Scope of Work

- Study of Legacy Hardware & Software of ACMC.
- Software & Firmware Re engineering of ACMC.
- Hardware and software testing.

Executive Summary

The objective of the project was to re engineer the Actuator Control Machine card to eliminate erratic behavior, resizing of the card & repositioning of Hall assembly.

The project was to control the position of a Charge Motion Control Valve (CMCV). CMCV actuator controls a rotational valve to one of the two commanded positions; open and close. The master sends a command to the controller and the command is responded by the controller by giving back the angle position of the valve.

System Overview

The complete system was built around the PIC microcontroller.

Microcontroller receives the command signal from user interface and gives the actual position information of the motor as a response signal. Hall sensor gives the information of actual position of the motor in terms of voltage. Microcontroller actuates the motor using PWM signals. H-Bridge was used to drive the motor.

It could handle high current rate up to 5A, and it provides load current feedback as proportional to $1/375$ of the load current.

Using this feedback, current trip protection was implemented by interfacing comparator circuit to microcontroller.

ICSP (In Circuit Serial Programming) method was used to program the microcontroller.

Value Addition

- Designed test jig to validate the functionality
- Proposed Auto calibration for ACMC which would help the operator to perform the calibration at the time of production testing. This would down time & money taking into consideration millions of pieces rolled over every year.

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