Abstract

My thesis is about a development of a laboratory test measurement system for tachometer sensors. The tachometers can give information about crank shaft and camshaft using encoder wheels. The engine control unit can not produce the perfect engine operation in case of lack of the signs or incorrect detection of them. My project was to find out and to create a system, with which the bad sensors' behaviors and faulty parameters can be detected.

The introduction chapter gives us short information about the evolution of the automobile industry and the complex sensor networks. This is followed by the introduction of tachometer sensors with their main properties, with the background physical knowledge and the most important parameters of sensors, which should measure the system correctly. These parameters are the angle of rotations of measured signs, the pulse width, the absolute and the repeatability accuracy.

The development began with the recognition of the previous system's deficiencies and continued with the guessing of the new system's requirements. After that came the making of a new system design, the production and the purchasing of the components. The device is based on digital signal processing, which contains an ambient microcontroller unit and a LabView development environment.

The implementation chapter shows the major part of my job, which was the programming of the two systems in two different languages: embedded C and graphical programming of LabView. The chapter introduces the structures of the codes, the used algorithms in detail; furthermore it functionally describes the user interface written in LabView.

The two last chapters present the further development opportunities and the remaining tasks for improving and finalizing the measurement system. After that it summarizes the phases of the full development process and provides a comprehensive overview about the steps which led to the completed system.