

## **Abstract**

The subject of this thesis is one of the important test methods of modern automotive industry. In this domain, the electronic devices and controls have more and more importance. Therefore, when a new, complex system is developed, it is important to have an appropriate test system. Given the need to develop new products faster and faster, it is crucial that a) while the new hardware is still in development the development of the software for it can be started, and b) there is a possibility to independently test the subsystems. For this kind of testing one widely used method is the hardware-in-the-loop testing. The essence of these systems is that we can build a hardware simulated environment to test our controller as if it was embedded in its final place.

My task was to develop a novel test system for a special controller, which is fully suitable for controlling a BLDC motor. This includes the selection of the needed hardware elements and the development of the connections between them.

In this thesis I present the steps of the development process of a hardware-in-the-loop system from the initial conditions to the functioning hardware and its basic testing. At first, I created a logic system plan with the functional and non-functional conditions. I made the block diagram of the system and selected the most suitable hardware elements. Then I created the necessary libraries for the components and drew the schematic diagram. Then I made the PCB design based on the schematic diagram and the specified physical conditions. After the panel has been manufactured, with continuous insertion of test steps, I set the parts on the panel. Finally, I performed the basic testing of the system.

When the system will have been fully functional it will be used for real industrial testing.