

## Abstract

AUTOSAR is an international standard defining a unified software architecture for Electronic Control Units (ECUs) of modern vehicles. The Basic Software Layer (BSW), one of its main layers provides hardware abstraction for the application software components and ensures their portability. The BSW consists of modules with different functionality. This BSc thesis offers a functional overview about the BSW communication stack and describes the implementation of two modules of the CAN stack: the CAN Transport Layer (CanTp) and the CAN State Manager (CanSM).

The main purpose of the CanTp module is to segment and reassemble CAN messages longer than 8 bytes. The module is based on the international standard ISO 15765. The CanSM module is responsible for the control flow abstraction of CAN networks. It realizes the state machine controlling the states representing different operation modes of the CAN controllers and transceivers and the transitions between them.

The first part of my thesis introduces the CAN standard, followed by a section about AUTOSAR. After the basic description of the standard, this part focuses on the BSW communication stack. The subsequent chapters summarize the development and testing of the modules. The ISO standard is shortly introduced at the beginning of the part about CAN Transport Layer followed by the description about the development of the transmission and reception algorithms considering the optimal use of resources. The next part gives a short theoretical summary about testing and shows how the CanTp module has been tested illustrated by an example. The chapter about CAN State Manager describes the basic methods for implementing state charts in general, and verifies my solution for the implementation. This part also deals with the resource use and testing of the CanSM module.