
**KATEDRA AUTOMATYZACJI PROCESÓW TECHNOLOGICZNYCH I ZINTEGROWANYCH SYSTEMÓW WYTWARZANIA**

**WYDZIAŁ MECHANICZNY TECHNOLOGICZNY**

**POLITECHNIKA ŚLĄSKA**

**PRACA DOKTORSKA**

# Metoda pozyskiwania informacji eksploatacyjnych w układach mechatronicznych

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**Gliwice 2023**

# SUMMARY


## The method of acquisition operational information in mechatronic systems

This doctoral dissertation focuses on the aspect of acquisition data and operational information from complex mechatronic systems belonging to the group of electric Electric Vehicles. The subjects for research were electric vehicles or modernized internal combustion vehicles, in particular electric buses and minibuses.

The theoretical part of the doctoral thesis discusses guidelines, standards and regulations, presents a review of norms and scientific literature and research trends indicating the legitimacy of undertaking research in a defined topics. The characteristics of the analysed electric vehicle and the identification of key functional parameters in the context of monitoring against the background of available market solutions are also presented.

The scope of the work presents the assumptions of the research method, which was written by means of a set of block diagrams covering all stages of modernisation of internal combustion vehicles to EVs and equip them for monitoring and telemetry subsystems (including electric vehicles). The adopted scheme for the acquisition and data structures of vehicle communication networks, adapted to the author's converters of signals from the CAN bus to the USB standard, are discussed.

Subsequently, author's data acquisition tools were presented, including communication converters (CRUSB Spartan v1.4 and CRUSB Huzar v1.0) and data acquisition software (CANStudio, CANMonitor, CANLOGAnalyzer).

There are also presented selected cases of method validation and operational testing of real objects, based on examples:

- retrofitting of a diesel bus to the electric vehicle - modification of the drivetrain system, control system and operating parameters monitoring,
- diagnosis of abnormality in the operation of the electric bus drive system in the HV circuit switching ON phase,
- monitoring the parameters of the vehicle's energy recuperation system,
- monitoring and diagnosis of the drivetrain system,
- identification of abnormalities of functional subsystems in electric vehicles.



**Keywords:** electric vehicles, monitoring, diagnostics, telemetry, CAN networks, operational information acquisition, data analysis.