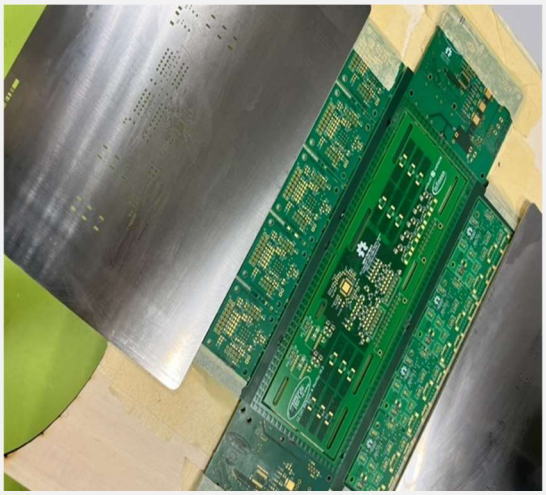
K2DM – LIL Experiment Outline

TERA (P53F02st) - Virtual Vehicle BMS demonstrator

THE CHALLENGE *Battery Management Systems (BMS) are crucial components in modern electrified vehicles that ensure the monitoring of battery cells, and that's how the safe operation of electrified vehicle safety is enabled. Currently, multiple (expensive) industrial BMS solutions are available which require a unique hardware design and the corresponding software interface. The project idea is to* ***develop a full-solution BMS package*** *that provides the hardware-software solution* ***for further usage on Virtual Vehicle projects****. The product is tested on the IBEX (2-seater prototype TERA battery-electric driven vehicle).*

SOLUTIONS AND METHODOLOGY

Twelve boards are designed within this project based on the Infineon TLE9012 chip **(**see Fig.). Each board can be configured to monitor up to 12 battery cells and 5 temperature sensors. Furthermore, an applicable **software driver interface** (based on C++20) **is implemented** to complement the measurement hardware. In addition, the usage of C++ language features was utilized to ensure the safety of the BMS.



RESULTS AND IMPACT

The entire BMS, including hardware and its corresponding software, is assembled, and developed within this project. This BMS can monitor the key parameters of the battery. The BMS design will be used as a reference platform or testbed for evaluating novel battery charge and lifetime estimation algorithms. Furthermore, the software can be reused and adapted for new measurement hardware or integrated into a different BMS platform in future Virtual Vehicle projects.

Project Duration	30.11.2022 – 27.10.2023	**Project Partners**	TERA TU Graz
Experiment No.	-	**Dept./Group**	Dept E/Battery group

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