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## D5.1 – Battery Management Unit from RWTH Aachen

<b>Project Acronym:</b>	Nautilus
<b>Project Title:</b>	Nautical Integrated Hybrid Energy System for Long-haul Cruise Ships
<b>Project coordinator:</b>	Dr. Asif Ansar, Deutsches Zentrum für Luft – und Raumfahrt (DLR)
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## Deliverable D5.1 – Battery Management Unit from RWTH Aachen

<b>Short summary:</b>	The Battery management unit (BMU) ensures that the battery is working within a safe operation window and provides information of the battery system for diagnosis and the control unit. The battery is supposed to ensure fast transient operations based on the ship's electrical load profile. Additionally, the BMU will predict the available power or energy for upcoming time intervals (e.g. next 5 s, 30 s, 60 s, 15 min for FC-ramp up) with prediction algorithms (e.g. state of available power/energy). The control strategy will utilize these algorithms to conduct the power management for the components (battery and fuel cell system).
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### Dissemination Level

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# 1 Battery Management Unit for a hybrid maritime propulsion system

## 1.1 Introduction

Within the frames of the research project, a Battery Management Unit (BMU) is developed, which ensures that the battery is working within a safe operation window and provides information of the battery system for diagnosis and the control unit. The BMU was realized in the form of a hardware unit running battery diagnostic algorithms.

On the one hand, the BMU is a gateway between the signals of the battery management system (BMS) of the battery system of the genset and, on the other hand, signals are calculated in the BMU that are used to control and share the load. These signals are processed by the energy management unit (EMU) and used for power sharing between the drive components. An overview of the connection of the BMU can be seen in Figure 1.

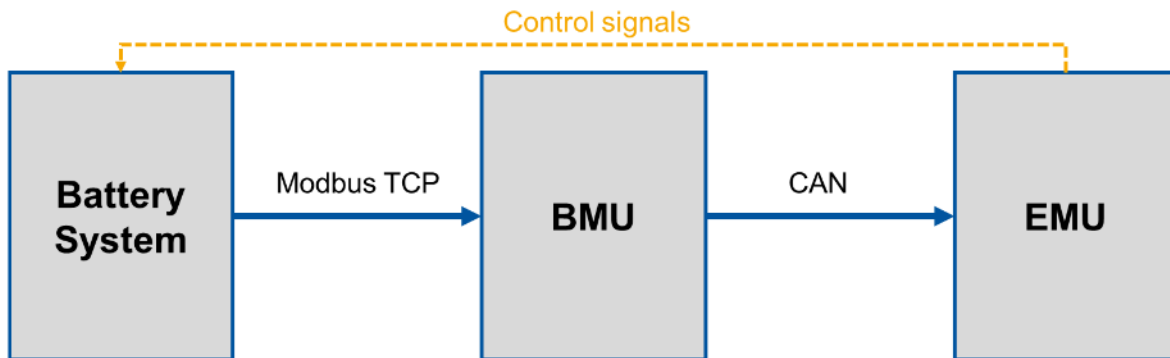


Figure 1: Schematic of the connection of BMU