Modular CAN-Bus-System for small vehicles

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Figure 1 shows the structure of the Modular CAN-Bus-System which has been developed for a small EV. With the Modular CAN-Bus-System it is possible to use the advantages of a CAN-Bus-System for a small vehicle in a cost effective way.
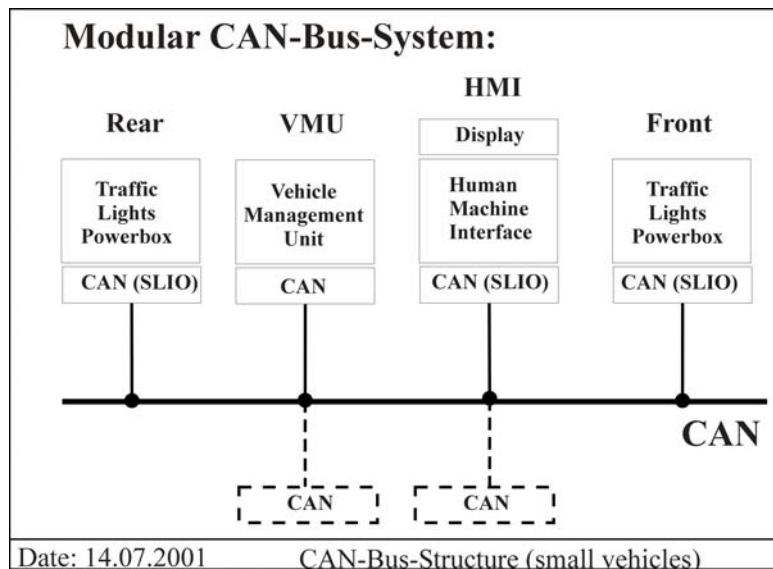

Figure 1: Structure of the Modular CAN-Bus-System

The advantages of CAN-Bus-systems (high EMC, high transfer rate applications and high flexibility for the electronics) lead to a higher quality of the vehicle. The use of CAN-Bus-Systems for small vehicles seems up to now not economical because of higher costs for new electronic components.

Small vehicles have a lot of consumer loads which are concentrated only at few places. The same applies to all User Switches and the dashboard which are placed nearby the driver. By the use of modular design rules the consumer loads, the display and the switches can be combined into function groups. These groups can be parts of the vehicle body so that the production, the montage or the exchange (in the case of maintenance) of these modules are uncomplex and cost effective.

For the Modular CAN-Bus-System these modules get a CAN-Bus communication and a power supply interface. This leads to a cost and weight reduction because the cable tree is replaced by only 4 cables.

The Modular CAN-Bus-System is based on small CAN-Bus interfaces which are combined with power switches (Mosfet technology) to "Switching Box" modules for the consumer loads or with the vehicle control switches to the "User Switches" module. These modules are described in detail in the full paper.

The proposed Modular CAN-Bus-System has the potential to transfer the advantages of a CAN-Bus-System to small vehicles. By simultaneous use of the modular design advantages it will be possible to equalise or even reduce the costs compared to a conventional system. Especially for service and maintenance the Modular CAN-Bus-System will lead to cost reductions during the lifetime of the vehicle.