(Photo: Miunske)

Customized CAN-connectable electronics

What have a fire-patrol vehicle in the Netherlands, a windrow turner in France, and an ambulance in Poland in common? In the first glance, it is not much. But the central electrics come from Grosspostwitz nearby Bautzen in Saxony (Germany).

Modern vehicles and machines need a solid power supply, specifically designed in shape of a vehicle power electrics/electronics. Anyway, vehicle manufacturers most likely reduce the number of suppliers constantly and source hardware, development work, and programming out of one hand at best. Johannes J. Miunske, who did found his company in 1996, now with 70 employees, is exactly working towards that goal. It began with trading of electric vehicle components. Pretty soon customer's desires led to services like the completion of assembled units. Smaller services led to developments of more complex systems, the assortment was steadily growing. Miunske finally kept the distribution of at least eight renowned partners but, the development of complex systems and components for trucks, special vehicles and mobile machines grew up to a solid second column.

Figure 1: Developer place in the electronics development; the conception of the PCB's begins if all functions are guaranteed (Photo: Miunske)

Figure 2: The CAN switching and display units are another mainstay; the photo shows a central control and monitoring panel for a drilling vehicle (Photo: Miunske)

The smart central electronics in a vehicle is the centerpiece for communication and power distribution, according to electronics team leader Dipl. Ing. (FH) Sebastian Mueller. Besides power

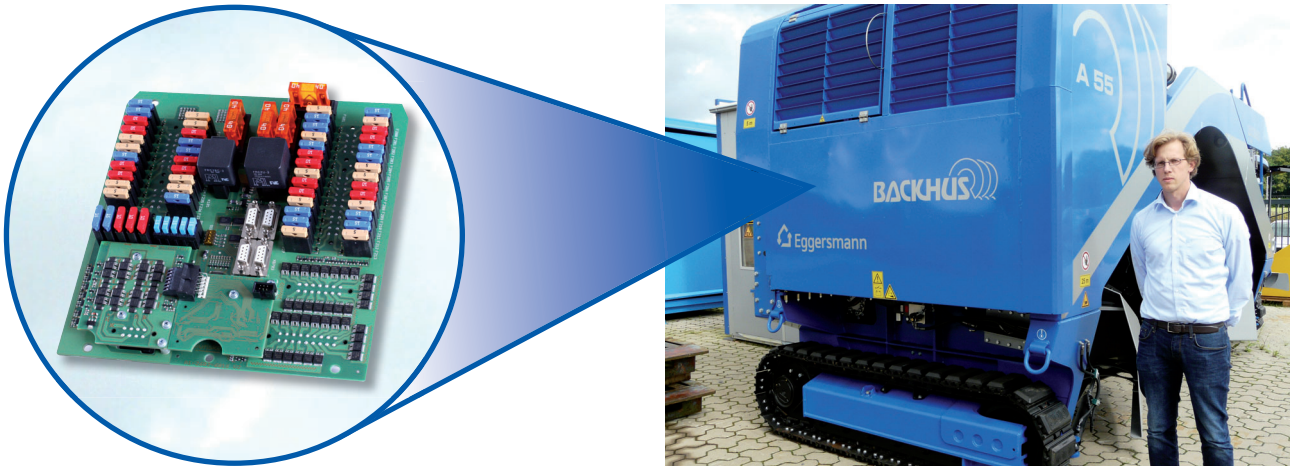

Figure 3: The development time of the all new central electronics for Backhus took no more than four weeks. The approved and ready-to-mount PCB's are now manufactured in small and medium quantities which means about 60 annually (Photo: Miunske)

distribution and switching of various loads and power circuits, the protection, and diagnosis of possible failures are vital to the system. Due to Miunske's wide spread know-how within vehicle electronics combined with a strong development competence they can provide a short-term realization of customer specific demands. The experts from the Oberlausitz region work 'on the spot' as the brand claim expresses. This incorporates development, production, and delivery just-in-sequence for their global customership.

A typical example is the company Eggersmann, located in Halle, NW. Their recycling machines, brand name Backhus, are renown worldwide and built for removing recycling material. Both companies cooperate since several years regarding these caterpillar driven machines. Instead of two free programmable central electrics modules an electronic solution had been found.

Sebastian Mueller: Although the compost remover is quite large space is the challenge. The electronics should be well accessible mounted, protected and the generated ▷

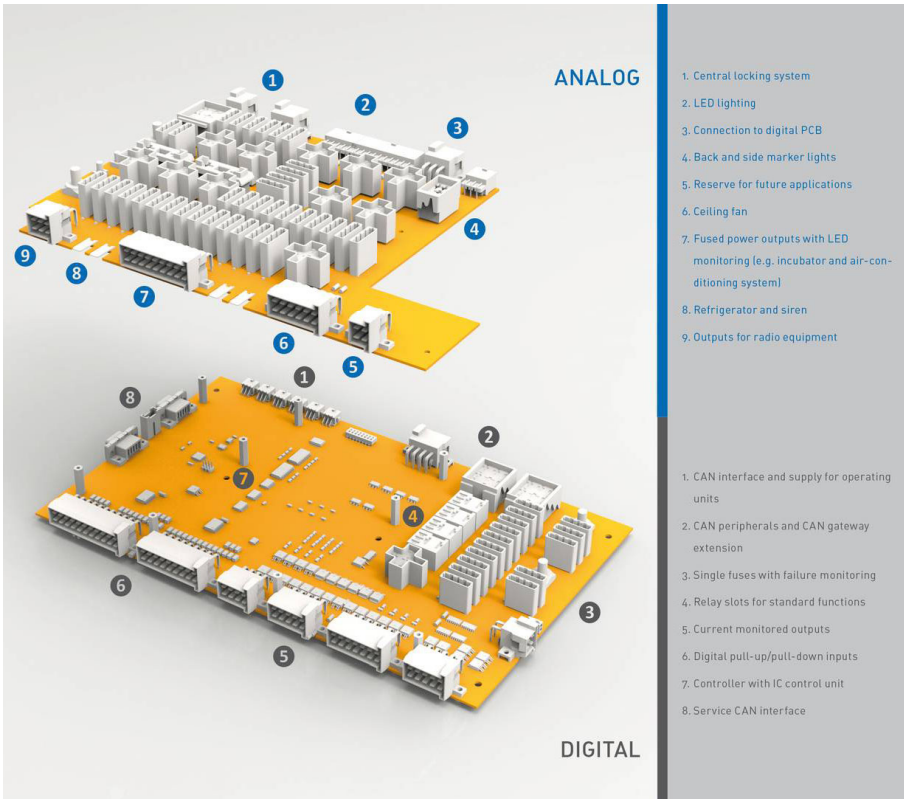

Figure 4: The CAD-drawing shows the modular concept of an ambulance's central electronics; Depending the project demands the range of functionalities can be modular varied (Photo: Miunske)

Features of the customizable device

General:
- Max. space of PCB: 300 mm x 400 mm
- Max. thickness of PCB single layer: 2 mm
- Number of layers depending on demand
- Customized hardware

Central electrics as a power distributor:
- Multi-layer PCB (printed circuit board) - popper thickness for conductor tracks up to 105 µm
- Continuous power load 150 A to 200 A
- Components (fuses, connectors, etc.) soldered, connector bolts press-fit technology
- SMD assembly used for discrete components like transistors, diodes, LEDs

Central electrics as a smart version:
- PCB with copper thickness for conductor tracks up to 70 µm
- Continuous power load up to 100 A
- Mixed components in soldering technology
- SMD assembly and press-fit technology up to 0,5 mm pitch
- Smart functions and power applications on one pcb
- Micro-controller designed for customized software
- Outputs current controlled
- Self-diagnosis capability
- Communication interface via CAN

heat should be led away. The choice of the day was highly integrated semi-conductor technology. This has saved space and could add additional functions like output power control or self-diagnosis capabilities. Another positive side of the Miunske solution is: The combination of press-fit bolts and power components using soldering opens quite flexible manufacturing.

Since years bus systems connect not only but especially in off-road vehicles and machines the units like motor controls, drive train, pumps, indicator and switch panels as far as safety modules. Further on, they are vital to communicate failure transmission or remote maintenance capabilities. The broad spectrum of CAN modules provides various possibilities individualizing project designs.

They especially had been designed for mobile applications within the 9 V_{DC} to 36 V_{DC} range, carrying de E-certificate. All CAN products communicate with up to 1 Mbit/s with a free parameterized transmission rate.

The often times small numbers of European special vehicle manufacturers are almost leading to insoluble cost problems at the big players in the market.

Miunske, as family owned business, represents a highly estimated value among the special vehicle manufacturers. In the case of Backhus the approximate development time had been two months. The approved and ready-to-ship pcb's are now in production in small series of 60 pcs p.a., a successful example for a very flexible supplier.

The board, which incorporates the two daughters of the founder, their husbands, and the surrounding team of well skilled professionals can do much more - the state-of-the-art CAN switch panels and I/O modules. All will be customer specifically manufactured and parameterized through the self - developed software Miunske-toolchain. ◀

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