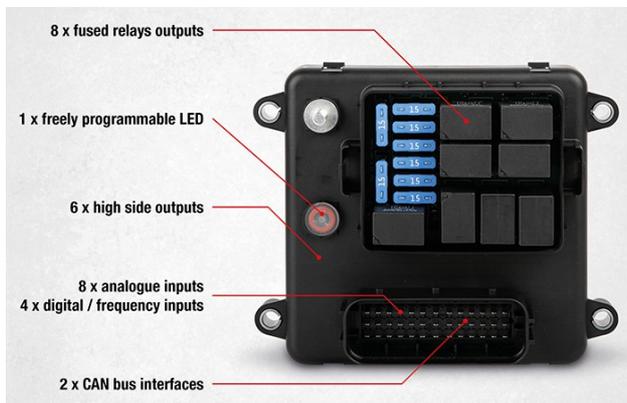# CAN *Newsletter Online*

Programmable solution for power supply

Wuerth Elektronik ICS is provider of system solutions for mobile machines and commercial vehicles. By combining its concepts in both areas, the manufacturer developed the CAN Box 8FR6 solution for power distribution and function control.

A solution for power distribution and function control (Source: Wuerth Elektronik)

The product can be programmed and it offers various diagnostic options. Along with this product, the company is also introducing the software tools Wecontrol Designer and WE Flasher. The CAN Box 8FR6 features an NXP 32-bit Cortex M4 microprocessor, offers 128 KiB of RAM and a 512 KiB flash memory as well as 2 KiB F-RAM. The 17 cm × 14 cm × 7 cm IP64-rated box has eight fuse and relay outputs and six high-side outputs and is used for power distribution to multiple loads.

In addition, there are eight analog inputs, four digital or frequency inputs with switchable pull-up resistors and two CAN interfaces. Each relay output can accommodate a load of up to 15 A, and each high-side output up to 2 A. The high-side outputs are all PWM-capable, meaning they can also be used for dimming lighting systems. All outputs, including the eight relay outputs, are current-sensing. The relays provide digital feedback of each output (NO/NC), allowing diagnosis of defective fuses or monitoring of relay status.

Operation

The current load of the box is yielded by the number of activated relays and the values of the built-in fuses. The company recommends programming an application limitation and a system warning via CAN communication to avoid having the temperature inside the box rise above 100 °C. Two temperature sensors are built into the box for temperature measurement.

Current is distributed to the relays and electronic outputs of the module via an M6 power supply terminal. The CPU (central processing unit) and the electronic parts of the box are powered by one of the pins of the 39-pin Leavyseal connector. The separation in the supply also enables separated fuse protection of the power and logic lines.

The product is programmable and offers a range of diagnostic options (Source: Wuerth Elektronik)

Applications

The CAN box offers a range of diagnostic options and can actively send warning and maintenance frames. Activation cycles and operating hours can be stored in the FRAM, when appropriately programmed, and provide a comprehensive overview of vehicle usage. The product is also able to take control of most consumers such as lighting systems, so freeing up the inputs and outputs on the other controllers for sensor handling or machine-specific tasks. The number of inputs and outputs means that several boxes can be integrated into a decentralized system, enabling retrofit existing systems.

The box allows a reduction of the cable cross-section, which in turn reduces weight and offers cost savings, explained the company.

Conventional solutions usually check the load current and select a fuse with the rated value of at least 25 % above the load current when defining the protected power lines. Taking all these parameters into account, users then calculate the cable diameter. The cable can be designed with a smaller buffer when used with the CAN Box 8FR6 because the box provides current measurement at each output. The current measurement enables the overloaded output to be switched off if the current exceeds the normal load by 10 % for more than 5 minutes, for example.

Freely programmable

Together with Wecontrol Designer, the box is programmable. The editor in Wecontrol Designer contains numerous function block libraries that accelerate programming, said the company. With the IEC 61131-3 compliant programming environment, standardized protocols such as J1939 or CAN can be used. Users can integrate the device into the software environment of the machine manufacturers by implementing the UDS bootloader.

The company offers WE Flasher to support the UDS protocol. This tool can communicate with UDS via CAN and search the CAN network for the CAN Box 8FR6 in order to then upload applications or firmware updates. The CAN box can be adapted to different types of consumers or functions because it is freely programmable.

The device is a standard product. The relays and fuses can be selected according to the customer's application, but the German company recommends using 10-A/15-A relays. The field application engineers at Wuerth are also available for programming the box or for software training.

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