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CAN Newsletter

Hardware + Software + Tools + Engineering



*CANopen train communication network
(TCN) on Swiss double deck train*

*CANopen data-recorders
for the railway industry*

*Environmental robot powered
by CANopen-driven motors*

Rail in-vehicle networks

FireCAN: Open network for fire-fighting trucks



Several Austrian and German bodybuilders of fire-fighting vehicles and some of their suppliers have developed the FireCAN profile. The specification is held and maintained by Rosenbauer, an Austrian bodybuilder. In June, at the Interschutz exhibition in Leipzig (Germany), the FireCAN profile was introduced officially. The profile is based on CANopen, but it is not completely compliant to the CiA 301 specification.

The FireCAN network interconnects third-party devices such as portable fire pump, generator, recharger, winch, light tower, and warning signal unit. It is connected via a gateway to the proprietary CAN-based bodybuilder network, which comprises another gateway to the in-vehicle networks.

The FireCAN specification defines the CAN connector and standardizes its pin-assignment. Allowed are 5-pin M12 or 7-pin bayonet nut connectors. The CAN physical layer is ISO 11898-2 compliant, and the bit-rate is fixed to 250 kbit/s using a sample point as defined in CiA 301 (CANopen).

The NMT, SDO, Heartbeat, and SDO services and protocols are compliant to CANopen. Heartbeat is mandatory. It shall be transmitted with a period of 1 000 ms. After power-

on, the first Heartbeat shall be transmitted at maximum after 2 s. The FireCAN devices use the PDOs 4 to 15. The PDO parameters are fixed and not accessible in the object dictionary. Nevertheless, the PDOs are well defined regarding the communication as well as the mapping parameters. The CAN-ID is calculated by an offset (64) multiplied by the PDO number plus the node-ID. For each device type – including the gateway to the body network – there are specified dedicated TPDOs. All these TPDOs are transmitted if one of the mapped process data is changed or the event-timer has elapsed (3 s). The PDO 4 of the recharger device contains the voltage value of the lower battery in byte 3 and 4 and the voltage value of the upper battery in byte 5 and 6.

Byte 7 and 8 provide the voltage sum. In byte 2, the battery under voltage is signaled by a 2-bit value. Byte 1 indicates several 2-bit status informations (e.g. charging in progress, charging finished).

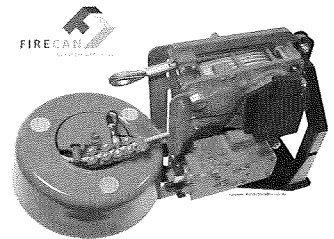
The node-ID depends on the implemented function. The gateway always uses the node-ID of 1, whereas the light tower, for example, is assigned with the node-ID of 13 or 14 (if a second is installed). The node-ID range is limited to 1 to 63. The node-ID assignment normally is done by means of electro-mechanical switches.

The implemented object dictionary is compliant to CiA 301. Mandatory are the device type parameter (index 1000_h), the manufacturer status register (1002_h), the pre-defined error field

(1003_h), the manufacturer device name (1008_h), the manufacturer hardware (1009_h) and software version (100A_h) as well as the identity object (1018_h).

At the Interschutz exhibition, Rosenberger and Iveco-Magirus launched fire-fighting vehicles providing a FireCAN gateway. Several vehicles by Magirus come with a FireCAN gateway. The company uses CAN technology also in its Multistar 2 trucks featuring cranes and telescope platforms. All mast movements are controlled by means of the CAN-connected controller – as are cage leveling and the jacking system. The operating method is identical with that for the turntable ladders.

The FireCAN interface simplifies the integration of third-party devices due to the specified plug-and-play capability. In addition, the diagnostics of these



FireCAN-compatible winch

devices is standardized by means of a special CAN message with the CAN-ID 740_h + node-ID. The 1-byte message contains a standardized failure number. It is re-transmitted with a period of 3 s until the failure has disappeared. The error history in 1003_h has in minimum ten buffers.

Rotzler has introduced FireCAN-compatible winches. The Treibmatic TR 030 winch comes with the Nexus all-in-one administration tool. The FireCAN interface supports a central control by the fire-fighting vehicle. The company expects a decrease of downtimes and fewer customer service calls. (hz)

www.iveco-magirus.de
www.rosenbauer.com
www.rotzler.de

Companies supporting FireCAN

Body builders:

- ◆ Iveco
- ◆ Rosenbauer
- ◆ Schlingmann
- ◆ Ziegler

Suppliers:

- ◆ Beos
- ◆ Dometic Group
- ◆ Elja Power
- ◆ Endress
- ◆ GTS
- ◆ Hänsch Warnsysteme
- ◆ Hella
- ◆ Federal Signal Vama
- ◆ Fireco

- ◆ Fischer Panda

- ◆ Fronius
- ◆ Ixxat
- ◆ KWG
- ◆ Leab
- ◆ Metallwarenfabrik Gemmingen
- ◆ MobIE
- ◆ Pinsch Bamag
- ◆ PWT Pomp Windentechnologie
- ◆ Rotzler
- ◆ Teklite
- ◆ Teksam
- ◆ Vector
- ◆ Votronic