Conformity to CiA 301 does not guarantee interoperability of CANopen devices. In particular, SDO time-out and boot-up behavior needs to be evaluated by the system designer.

The system designer is responsible to select the appropriate CANopen devices. Of course, the provided functionality should match to the application requirements. This is obvious. But there is more to be considered. For example, that the SDO client time-out is configurable to the SDO server response time capability. Some CANopen devices are “slow” regarding the response to an SDO request. In particular, when the SDO write request is permanently stored in EEPROM or flash memory.

Another interoperability issue is the boot-up behavior. There are CANopen devices on the market, which send as required a boot-up messages with the Heartbeat CAN-ID and the 1-byte payload containing a value of “0”. If the host controller with NMT master functionality uses the reception of the boot-up message as a trigger for the configuration of this device, it could happen that the device is still not in the NMT pre-operational state. In this case, the SDO configuration requests are aborted due to the SDO time-out configured in the host controller. Theoretically, there should be no delay, but some implementations are not immediately in NMT pre-operational state.

To overcome those interoperability problems, the system designer can program the configuration application software to wait for the Heartbeat message with the status pre-operational (value of 127) in the 1-byte payload. Unfortunately, the Heartbeat is by default disabled. This means, the host controller would wait until the cows come home. Of course, you can use pre-configured CANopen devices with a heartbeat producer set to unequal “0”.

To summarize: Conformity to CiA 301 does not guarantee interoperability of CANopen devices. Nevertheless, conformity to the CANopen specifications increases the probability of interoperability with other CANopen conformant devices, in particular, when they have been tested by CAN in Automation (CiA). Interoperability can be tested by means of so-called plugfests. The CANopen Special Interest Group (SIG) “Lift” schedules bi-annually such plugfests to test new CANopen Lift products on interoperability. Additionally, CiA Headquarters organizes on members’ demand general CANopen plugfests.

Author
Holger Zeltwanger
CAN Newsletter
pr@can-cia.org
www.can-newsletter.org
The Ultimate CAN FD Tool

neoVI FIRE 2

Vehicle Interface & Data Logger

Standalone gateway functionality between DoIP, CCP/XCP, CAN FD, CAN, LIN, and Automotive Ethernet.

Device includes:
- 8x ISO CAN FD
- 4x LIN
- Ethernet: DoIP/XCP
- Hardware Cybersecurity
- Standalone Logging, Scripting, & Simulation
- Full Vehicle Spy Software Support

Find out more at www.intrepidcs.com

INTREPID CONTROL SYSTEMS GMBH
USA  Germany  Japan  Korea  China  India  Australia
+49 (0)721 6633703 -4  icsgermany@intrepidcs.com