PDO cross communication

(Source: KEB)

The CANopen application layer provides the optional feature to send PDOs (process data objects) between any CANopen devices. The related configuration is named PDO linking.

The pre-defined CAN-ID connection set assigns by default to each CANopen device up to four CAN identifier (CAN-IDs) for PDOs to be sent and up to four CAN-IDs to be received. These CAN-IDs contain in the seven least significant bits the node-ID assigned uniquely by the system designer. This enables an off-the-shelf interoperability between CANopen devices with NMT (network management) server functionality and the CANopen host controller with NMT manager functionality. Optionally, the CANopen devices support the configuration of the related COB-ID (communication-object identifier) parameter via SDO (service data object) or USDO (universal SDO) write access. Configuring these parameters in the CANopen devices, enables a direct PDO communication. This could be a point-to-point communication between two CANopen devices with NMT server functionality or even a multi-/broad-cast PDO communication between several or all CANopen devices.

Not all on the market available CANopen devices support this optional feature. KEB Automation, CiA member since 1992, was one of the first suppliers of CANopen-connectable frequency inverters. Recently, the company launched a CANopen firmware for its Combivert F6 and S6 drive controllers supporting PDO cross communication. This means that plant and machine manufacturers using the corresponding drives can benefit from more flexible communication between the inverters. Another advantage: Users can utilize all PDO-mappable parameters.

"The cross-communication enables the direct exchange of information and data between the inverters without the information having to take the 'diversions' via the customer controller and other fieldbus participants," said Tobias Wenneker, Product Manager Drives at KEB. The fact that the data can now be exchanged independently and no longer necessarily via other participants, means that a faster data flow can be achieved. In the drive trains of many machines, it is not uncommon for milliseconds or even microseconds to be crucial. With a rigidly coupled shaft, even small delays can therefore lead to considerable damage to the shaft in the long term and therefore to machine downtimes.

"Whether it's torque, position, or speed: Plant and machine manufacturers are free to decide which data they want to work with," said Wenneker. Up to ten F6 or S6 devices can communicate directly with each other. The independent exchange of data also can reduce the load on the machine's Ethernet-based backbone network. Last but not least, PDO cross communication also makes it possible to set up multi-level communication systems, in which the inverter acts as a CANopen NMT server device and the upper-level network as a network manager device, and vice versa.

In general, the advantages of PDO cross communication come into play in many application areas – for example, where high torques are required. In this context, fast and synchronized torque sharing of ▷

Brief news: CANopen drives

- ***Sumitomo Drive Technologies:*** The Japanese company has introduced the Smartris drive comprising a CANopen servo, a gear, and optionally a wheel. The CiA 402 compliant device can operate with a maximum speed of 2 m/s and an acceleration of up to 1 m/s^2. The product is intended for AGV/AMR applications.
- ***Delta Line:*** The Swiss company offers the Pegasus B144 motor drive featuring an optional CANopen interface. It is designed to control brushless motors up to 48 V_{DC}. The 144-W product measures 54 mm x 54 mm. It can be applied to AGVs, AMRs, and pumps.
- ***Faulhaber:*** The 22xx…BX4 family of motion controllers comes with a CiA 402 compliant CANopen interface. The product can be integrated into the by 18-mm extended motor enclosure. A 16-bit encoder is embedded.
- ***Dunkermotoren:*** Ametek has launched the BG 75 dMove brushless motor, which can be combined with gearboxes, brakes, and encoders. The 480-W rated product has a CANopen interface compliant to CiA 402. It features a nominal speed of 3190 rotations per minute and a torque of 1,44 Nm.

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the drives is crucial. The Combivert drives enable this through the direct exchange of torque values by means of PDO cross communication without a PLC (programmable logic controller) loop. In this way, machine and system manufacturers can not only increase efficiency, but also the overall service life of the system, explained the company. ◀

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