

Encoder and inclinometer for heavy-duty applications

In many outdoor applications such as harbor cranes, trucks, and construction machines CAN-based control systems are used. Increasingly, CANopen sensors gain acceptance. In particular, encoders, linear position sensors, and inclinometers are equipped with CANopen interfaces. This kind of applications requires special housings and extended temperature ranges. In some applications, also safety-related communication is demanded.



THE CANOPEN SAFETY PROTOCOL is the only standardized option. CiA working groups have started to include in the CiA 406 encoder profile and the CiA 410 inclinometer profile standardized SRDOs (safety-related data objects). In addition, both specifications will be enhanced by means of configuration parameters and process data. The CiA 410 profile will include also the temperature of the sensors. This process data may be transmitted in PDOs. All interested parties may submit their ideas to CiA, so that the responsible task forces can consider them.

Robustness and reliability

Hardly any other application demands more from a sensor product than outdoor deployment. Operation and functionalities must not be affected by frequent and extreme temperature fluctuations, heavy impacts by shocks and vibrations, moisture, splash water or dust. Encoders, cable-pull encoders and inclination sensors installed at cranes or heavy vehicles in construction, agriculture, and forestry machinery for position and angle feedback must withstand the most hostile environments.

Baumer provides an expansive product portfolio with sensor solutions that are specifically conceived for installation at cranes, mobile work machines and heavy-duty utility vehicles: Absolute multi-turn encoders that operate on a patented magnetic sensing principle master tasks like position feedback and rotational angle detection at crane booms. IP67 protection ratings, temperature resistance (from -40°C to $+120^{\circ}\text{C}$), and optional redundant configurations ensure utmost operational safety and reliability. Communication with master control systems is provided by the CAN interface with CANopen or SAE J1939 support. Thanks to several cable measuring lengths up to 50 m and the high degree of linearity, typically 0,02 % of the measuring range, the sensors provide the requisite capabilities for dependable outrigger position feedback and position detection in drilling applications, at excavators and crane booms. Acquisition of vehicle tilt and boom angle is performed by robust inclination sensors with one or two channels and variable sensing ranges through a 360° angle. But the robust Baumer sensors are capable of more. They not only endure the harsh conditions of outdoor applications, but match even most demanding requirements in terms of safety and reliability by SIL and PL certified products and configurations that excel with an MTTF (Mean Time To Failure) rating of more than 100 years.

