

## Anniversary: Measurement in drives and mobile machines



Figure 1: Speed and length measurement directly in the tool (Source: Wachendorff)

For 40 years, Wachendorff has been offering CAN-based sensors and automation products for mobile machines and municipal vehicles. Here's a little time travel.

In the beginning, the company offered small and robust speed displays in vertical drilling machines as well as temperature displays in asphalt machines. For about 25 years, Wachendorff has also supplied incremental encoders as sensors for outdoor applications. Initially, they were used as speed sensors, consisting of a rotary encoder with a measuring wheel, as well as a robust mounting device, which produced the necessary contact pressure on the conveyor belts in quarries. Other applications included speed and position sensors on construction hoists, or speed sensors on wind turbines, often mounted on the slip ring.

Just over ten years ago, the company developed a series of absolute encoders that offer enormous advantages,



Figure 2: Encoder used in harbor cranes (Source: Wachendorff)

not only over conventional encoders, but also over conventional sensors, such as potentiometers or simple angle sensors. These enhancements make the products ideal for use in outdoor applications, or in environments with high mechanical demands (e.g., in mobile work machines, or even in aircraft elevators).

These absolute encoders feature single-turn Quatromag technology, which uses four Hall sensors and can measure angular position more accurately and more quickly than conventional sensors using a diametrically split magnet mounted on the face of the encoder shaft. With a patented calculation algorithm, interferences are eliminated. This gives the processing electronics much better signal quality with less noise. In addition, these multi-turn encoders are equipped with Endra technology; a technology that is able to count and store revolutions via a Wigand sensor, even when de-energized. Here too, a patented process enables precise and reliable signal processing.

In combination, these two technologies are almost unbeatable for mobile applications: Because it's contactless and enclosed in housing, it's wear-free, – and also has no moving parts such as gears; this paired with the fact that it doesn't have a battery makes it completely maintenance-free. The encoders work reliably and are temperature-resistant in ice or in the desert. They are also available in an off-shore version.

Another not to be underestimated advantage is the compactness (36-mm housing) and the low weight combined with high bearing loads and rugged protection classes such as the IP65, IP67, and up to IP69K. Wachendorff integrated the usual CAN interfaces compactly on one board (CANopen, CAN proprietary, CANopen Lift, and J1939). The applications have become very diverse. In combination with a pulley system, absolute encoders can be used for measuring the travel ▶



Figure 3: This encoder is suitable for optimal metering of grit (Source: Wachendorff)

of a boom or the reach of a truck crane arm; without a cable system – directly on the winch – they can be used for length measurement. Other applications include angle measurement in wind turbines, mounted on the gear ring or directly in the cam switch, and also the feed measurement on vertical drilling machines, as well as the measurement of steering information such as angle and speed on the wheels of automated guided vehicles (AGVS) or heavy transporters. Angle measurement on cranes is a special application, as two encoders can be used here for redundant information, or the measurement can be supplemented further with a proximity switch. Whether for off-shore or on-shore applications, customers can rely on stainless steel housing that has been tested for salt water resistance.

All applications have one thing in common: the properties mentioned above are important selection criteria for the company's customers. In many cases, Wachendorff has supplemented additional CAN protocol properties or implemented minimalist protocols so that the connection to the respective controller can be implemented as simply as possible. With CANopen Lift, Wachendorff was able to put together a standard in the elevator industry with some control manufacturers, which makes it easier to design and automate elevators.

More and more reliable and robust encoders from the company will be needed to ensure the safety and control of mobile machinery, municipal vehicles, and all other outdoor applications. With mechanical and electronic variants Wachendorff ensures that the sensor not only solves its task in the application, but can also be quickly integrated into existing designs; for this, they send Step files and advises customers on-site or over the phone with the experience of more than 2500 customized solutions that are in use worldwide. The company also ensures that the encoder is easy to assemble and arrives logistically sensible to the customer. Worldwide and always with a 5-year warranty.

**Author**

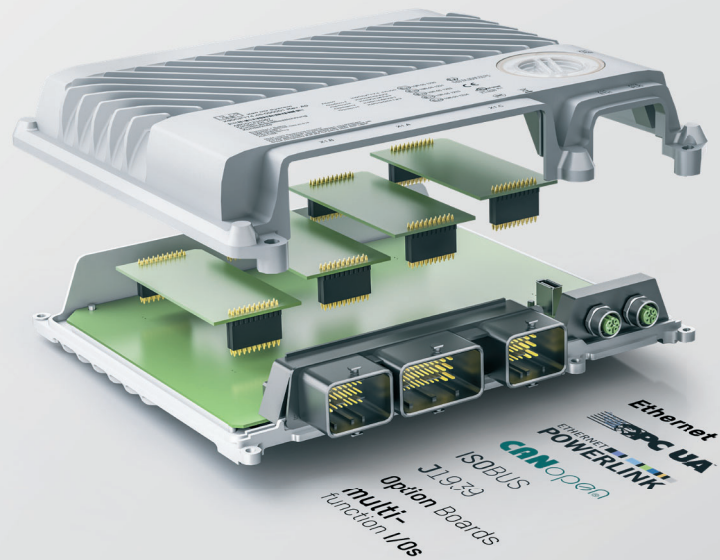


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