

Airborne wind energy system uses CAN drives

It looks like a paraglide. But it is not made for sport pleasure. It produces energy from wind power. The EK30 prototype system by Enerkite (Germany) uses CAN-networked compact drives by Faulhaber (Germany) to control the movements of the 21-m² kite.

THE IDEA IS SIMPLE: USING THE STRONGER and more steady wind higher up (about 100 m to 500 m) to generate electric power. The kite works in two phases following the so-called Yo-

Yo concept. In the retraction phase, the wing is flying crosswind, pulling out the rope with optimal force and speed. In the recovery phase, the wing is returning back to the starting point as fast and smooth as possible. The ground station allows to generate electrical power from the moment of retraction and to actuate the wing from the ground by use of differential drum drives. The prototype system can generate 30 kW. The inventor hopes to produce up to 300 kW in future airborne wind energy plants. Compared to usual wind power systems, the kite is cheaper and more efficient, the inventor stated.

In order to control the movements, small drives are used. They are supplied by Faulhaber and provide CAN connectivity. The drives are available with a proprietary higher-layer protocol and in a CANopen version compliant to CiA 402. They move the two control-ropes. The third rope is for the load generating the electrical energy. The automatic control was one of the main challenges. The control-ropes need to be always tight in order to wind them on the hoisting drum. This is why there are additional 200-W drives to tense the ropes. The motion controller unburdens the main-controller from managing these small drives. The system can be mounted on mobile machines as well as stationary ones. Both variants avoid expensive towers and blades. Offshore installations are possible in the deep sea, because they do not need complex foundations, just mooring buoys will do.



The mobile EK30 prototype system