



The new Gyro Swing at a Swedish amusement park generates 4-G forces and moves at over 100 km/h, with ABB's variable speed drive keeping the fun safely under control [Click here for video](#) 



For 140 thrill-filled seconds, screaming riders on the Loke Gyro Swing at Liseberg Amusement Park in Gothenburg, Sweden, get the amazingly exciting sensation of actually flying weightlessly through the air. The swinging pendulum motion and high speed of rotation thrusts 40 riders almost upside-down while simultaneously spinning them 360° around. Then, on the downswing, their bodies are subjected to massive 4-G forces at four times the Earth's normal gravitational pull while racing forward at over 100 km/h. When Loke finishes, the smiling, adrenaline-filled riders are clearly pleased.

“That was so incredibly fun!” comments an obviously ecstatic Anna Bjerne as she climbs off Loke. “It’s totally amazing when you are spinning at the top and your body lifts slightly off the seat. You feel thousands of butterflies running around your stomach!”

Delivering these thrills, and doing it safely, is no easy task. Although the technology used behind the scenes is something that most people never think about, ABB's variable speed drives (VSDs) play a critical role in keeping the rides moving, safely and efficiently.



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The leader in the field of amusement park rides is Intamin Amusement Rides group, which builds a large number of such attractions worldwide. Its sister company Inatec GmbH of Switzerland is responsible for the fail safe ride control system and supporting installation and commissioning the rides. Stephan Siegrist, Inatec's Engineering and Managing Director, is a big fan of the way that ABB drives keep everything under control to run the swing safely and accurately, while simultaneously simplifying the design.

### **Just one large motor replaces several smaller ones**

"This latest ABB drive – the ACS880-17 high-power regenerative drive with position control – perfectly supports our new design approach for the Gyro Swing," says Siegrist. "Now we can reduce the motors we need in the ride to just one. So, by selecting a single higher-power motor, we have decreased the complexity of the system by eliminating multiple gearboxes and encoders. This both simplifies the engineering and improves the reliability."

Safety is a key area where Siegrist sees major benefits, since ABB drives include integrated functional safety options to meet the highest global safety standards. "We get huge advantages from the high-level integrated safety functions," explains Stephan, "since they accelerate our development and installation work, with no need for separate programming or wiring workarounds."

The most important requirements for the Gyro Swing are safe operation, energy efficiency and rapid positioning for high throughput. The ABB ACS880 successfully delivered all three.

### **Voted the best in Europe in 2018**

Of course, the technology used behind the scenes means nothing if the ride doesn't attract customers and produce thrills. "The riders love Loke!" exclaims Kenneth Berndtsson, Technical and Safety director at the park, which has 3.2 million visitors per year. In fact, Loke was voted Europe's 'Best Thrill Ride 2018' by the amusement park journal, *Kirmes & Park Revue*.

The new drive's built in motion-control software also provides super accurate positioning of the seats when the ride stops, allowing people to get on and off quickly. "The tight position control speeds up the process of getting riders on and off," explains Berndtsson, "and that means more income for the park."

### **Capturing energy, instead of wasting it**

A further positive result from the ABB regenerative drive is energy savings which, Berndtsson says, is achieved by feeding the braking energy back to the supply network as the ride slows down. "Now we have a simpler system and, for each ride cycle we do, we put 1.4 kWh of energy back to the grid. This saves us money and helps meet our sustainability goals as well."



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