

Roller Coaster Wheel Force Multi-Axis and Load Pin

Industry: Entertainment

Summary

Customer Challenge

Roller coaster wheel assemblies are subjected to extreme changing forces as trains accelerate, brake, navigate tight curves, and pass through inversions. These loading conditions create wear, affect ride smoothness, and introduce potential safety risks if not fully understood during testing. Engineers need precise, real-world force data captured directly at the wheel interface to validate performance, improve durability, and ensure operational safety under ride conditions.

Interface Solution

Interface supplied high-precision force measurement products designed to capture real-time loading within roller coaster wheel systems. The 6A80 6-Axis Standard Capacity Load Cells were integrated into wheel bogie assemblies to measure multi-directional forces acting on the train during operation. LP Custom Stainless Steel Load Pins were installed at axle and mounting interfaces to capture shear forces and localized wheel loading under dynamic conditions. Results can be displayed and logged using the BX8-HD44 BlueDAQ Series Data Acquisition System when connected to a PC or laptop.

Results

The implementation of Interface sensor technology provided engineers with a complete understanding of wheel force behavior throughout the roller coaster cycle. The testing supported safer operation, increased component lifespan, and more reliable long-term performance of the roller coaster system.

Materials

- 6A80 6-Axis Standard Capacity Load Cells
- LP Custom Stainless Steel Load Pins
- BX8-HD44 BlueDAQ Series Data Acquisition System with supplied BlueDAQ software
- Customer PC

How It Works

1. 6A80 6-Axis Standard Capacity Load Cells are installed directly within the roller coaster wheel bogie assemblies to measure vertical, lateral, and longitudinal forces during operation. LP Custom Stainless Steel Load Pins are placed at axle mounting points to capture shear forces and localized loading within the wheel structure.
2. As the roller coaster moves through acceleration, braking, turns, and inversions, the sensors continuously record real-time force data at the wheel interface. Forces are measured using the BX8-HD44 BlueDAQ Series Data Acquisition System. Results can be monitored when connected to a PC or laptop with supplied BlueDAQ software.

