

Roller Coaster Structural Testing Wireless Telemetry System

Industry: Entertainment

Summary

Customer Challenge

Roller coaster structural engineers must verify that coaster track systems can safely withstand cyclical dynamic loading caused by high-speed trains, sharp turns, inversions, and braking zones. Continuous stress and vibration can create fatigue within track sections and connection points over time. A highly accurate force measurement solution is needed to monitor structural loads to ensure long-term ride safety, durability, and compliance with industry standards.

Interface Solution

Interface's WTS 1200 Standard Precision LowProfile™ Wireless Load Cells can be installed beneath critical support columns and track mounting locations. When connected to the WTS Wireless Telemetry System, results of all column points can be wirelessly transmitted and displayed through a customer computer with Log 100 software, or using the WTS-HK-S Next-Generation Wireless Handheld.

Results

Using Interface sensor technology, engineers successfully identified and validated force distribution throughout the roller coaster track structure during live testing conditions. It resulted in a safer ride operation, longer structural lifespan, and more efficient maintenance planning.

Materials

- Multiple WTS 1200 Standard Precision LowProfile™ Wireless Load Cells with integrated wireless acquisition module
- WTS-BS-6 Wireless Telemetry Dongle Base Station
- WTS-HK-S Next-Generation Wireless Handheld
- Supplied Log100 Software
- Customer PC or Laptop

How It Works

1. Multiple WTS 1200 Standard Precision LowProfile™ Wireless Load Cells are mounted beneath roller coaster support columns and track attachment points to measure compression forces generated during ride operation.
2. As the coaster train travels along the track, the sensors continuously capture force data created by acceleration, braking, turns, and inversions. When connected to the integrated Wireless Strain Bridge Transmitter Module, force results of all column points can be wirelessly transmitted to the WTS-BS-6 Wireless Telemetry Dongle Base Station and displayed on the customer's PC. Colored alarms can be set in case there is force overload.
3. Results can also be transmitted to WTS-HK-S Next-Generation Wireless Handheld.

