Introduction

In 2007, the International Association of Amusement Parks and Attractions estimated that more than 31 million people attended approximately 400 theme parks in the United States. While there is still a place for gondolas and ferris wheels, today’s theme parks must re-invent the thrill factor with new and innovative rides to maintain and increase park attendance.

Challenge

A large amusement park created a new and updated attraction that was, “designed to duplicate a cartoon experience, only at high speed and with lots of screaming.”

The operator needed a solution to monitor performance for this and other attractions. By collecting and analyzing parametric data points for the slightest fluctuations, as part of a predictive maintenance strategy, passenger safety and regulatory guidelines can be assured.

A robust, flexible, monitoring system is needed to ensure adherence to design specs, confirm safety and prevent costly operational shutdowns. These monitoring systems must offer a rich feature set that allows interfacing to existing industrial signal protocols. The features needed include:

- High-speed analog and digital inputs
- Extended voltage input ranges (±30 V analog, 30 V digital)
- Quadrature encoder inputs
- Internal and external triggering, retriggering, and pattern recognition
- Change-in-state and event logging
- Relay output for alarming

Real-Time Monitoring and Logging

Industrial Interfaces For:
- Voltage
- Current
- A Quad B Encoders
- Tachometers
- Sensors
Solution

The Measurement Computing LGR-5329 data acquisition logger was selected to perform high-speed portable data capture. The stand-alone product synchronously acquires high-speed analog and digital measurements up to 200 kS/s, directly to a Secure Digital (SD) memory card independent of a Programmable Logic Controller’s (PLC) operational performance. The LGR-5329 is connected through standard industrial protocols to PLCs, both stationary and on-board, which control the thrill rides. The device is programmed with simple, easy-to-use DAQLog™ software and operates in standalone environments without being connected to a computer.

The advanced triggering options of the LGR-5329 data acquisition logger allow selective acquisition of data. This data, once collected, is analyzed to identify and troubleshoot intermittent issues with subsystems such as compressor controls, air supplies, GFI power supplies, position locators and motor controls.

Summary

The goal of the organization is to “keep the rides up and running, maintaining the revenue stream, efficiency, and most importantly public safety.” The LGR-5329 was chosen to monitor the rides because of its small footprint, flexible integration into over a dozen rides, optoisolation, and high-speed data capture that is provided at one tenth the cost of other commercially available loggers.