- **The problem:** Climbing upwards of 125 feet in the air and reaching top speeds of 65 miles per hour, this record-holding wooden roller coaster provides a thrill to anyone brave enough to ride it. The scary part, however, was the safety and control system of this human-moving machine. Although effective when the ride was first built in 1997, the system was vastly out of date in 2022, raising concern for the safety of the riders. The controls of the ride were segmented, relying primarily on the attendant to start and stop the various components of the ride. The original control system also did not include system checks along the mile of ride track. It was up to the operator to identify, recognize, and act when something got out of system.

- **The solution:** HighPoint took on this task with customer safety and operator usability as the top priorities, while keeping the "ridesmanship" of the ride in mind. New emergency braking programming was added, as well as a programmable brake trimming system, which allows the operator to easily adjust the speed of a train car coming into the loading station for a smoother, safer stop during inclement weather conditions. Sensors were added throughout the ride track that monitored the status of every PLC input and output. Timing logic was also added along the track to monitor the train car's speed as it approached the brake zone. Speeds too fast or two slow were flagged for preventative maintenance. To improve the comfort of the riders, chain engagement ramping was programed for a smooth start and stop of the ride. All these improvements were tied into a new HMI (human-machine interface). The old push button board and hand lever brake was replaced with a 15" touchscreen display. By communicating with the other systems within the roller coaster (including the new brake systems and on-track sensors) and visually displaying them on the screen in real time, the operator could now easily monitor the status of the ride, assess faults, and quickly identify problems not only with the passenger train cars but anywhere along the track, eliminating downtime and turning this thriller into a safe and reliable ride.

- **The Hardware**

  - Allen Bradley Safety PLC 5069-L310ERS2

  - Allen Bradley 15" 5510 HMI

  - Point IO over Ethernet input/output racks

  - Powerflex 753 VFD Drive

  - Allen Bradley 802T-AP limit switches

  - IFM Efector IM1535 sensors
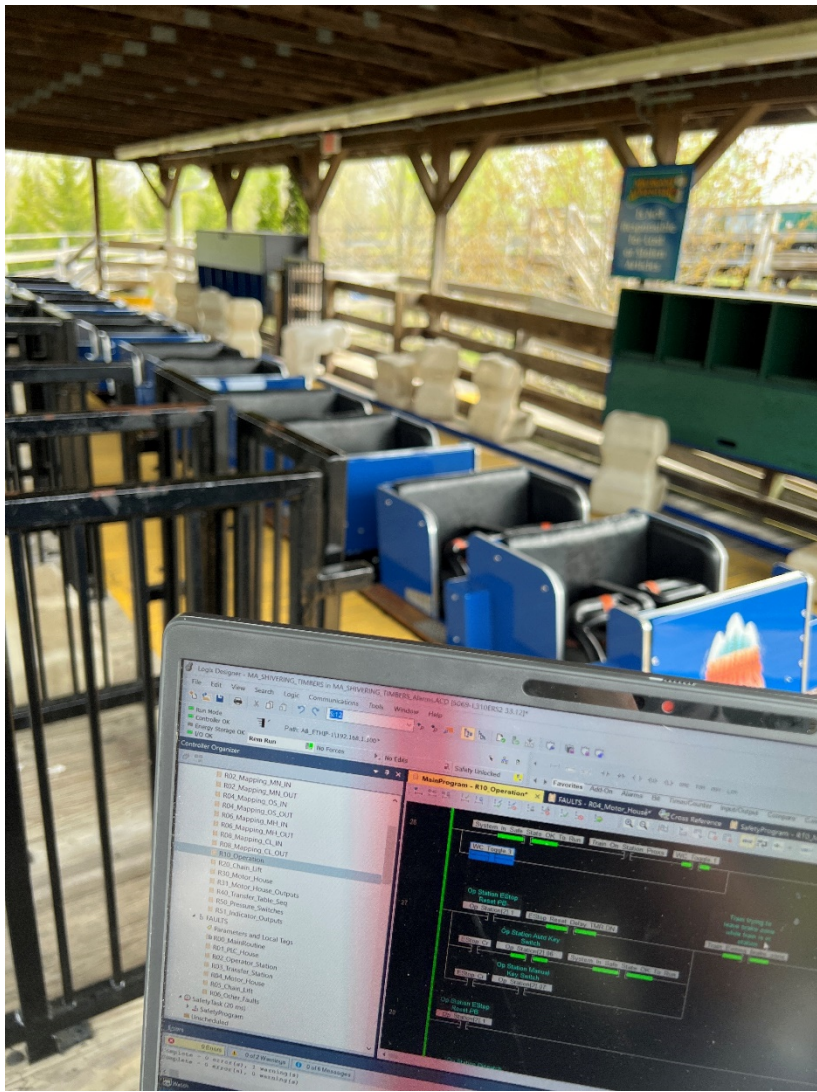
HighPoint offers comprehensive controls engineering solutions, specializing in the design, programming, integration, and support of automation systems. HighPoint works to repair, upgrade, and commission equipment based on the automation needs of our customers. From PLC and HMI systems to robotics and all automation equipment in between- **We're On It!**