



## Application Solution

# Grade Crossing Control Systems

## Increasing availability for crossings currently utilizing DC/AF track circuits

Operators responsible for grade crossings often face conflicting priorities - meeting stringent availability and safety requirements while managing budgetary constraints. Only a small percentage of grade crossings in North America are gated, leaving many thousands that are not wired for safety. In the case of grade crossings that are protected, commonly used train detection systems can be negatively impacted by environmental factors such as snow, leaf fall/accumulation, flooding, road salt and debris, and can require significant maintenance costs. In addition, when tracks become rusty in remote areas or on sidings, loss of shunt can occur and make the use of track circuits impossible.

### Drawbacks of current systems

- The reliability of track circuit systems can be decreased due to road salt, snow, flooding, debris, deteriorated track and ballast condition and the breaking of wire bonds
- High power requirements, high maintenance, and high installation costs
- Loss of shunt can occur on less frequently used tracks/ rusty rails
- Ballast impedance must be maintained to avoid unwanted shunting
- Properly maintaining the wiring of track circuit systems, especially in remote areas, is expensive

### Improvements needed

- Customizable, highly available, and reliable solutions
- A system not impacted by common environmental factors
- Equipment that operates in extreme temperature situations, providing high availability regardless of track and ballast conditions
- Low life cycle and maintenance costs
- Remotely accessible diagnostics for preventative maintenance
- An “electrification-ready” system
- Flexible and configurable outputs, including discrete I/O and Ethernet based solutions
- Flexibility to shorten or lengthen track sections for more efficient activation, deactivation and resetting of crossings



## Solution

The Frauscher Advanced Counter FAdC is a vital, SIL 4, fail-safe axle counting system that detects trains up to 280 mph, with flexible design capabilities for grade crossing applications. The outdoor equipment consists of RSR180 Wheel Sensors that are easily mounted to the rail in approximately 5 minutes, using the Frauscher rail claw.

Installation does not require drilling the rail. This outdoor equipment is then electrically connected to the indoor equipment via a 4-core signaling cable. Frauscher Axle Counters can be configured with hardware (discrete I/O) or software-based (Ethernet) interfaces. The FAdC can replace, or work as an overlay system to, existing track circuits to protect crossings.

Axle counters provide a high level of reliability with minimal maintenance, even in the harshest of conditions, allowing flexible implementation and seamless integration with existing infrastructure. In addition, the Frauscher Diagnostic System FDS identifies faults early and therefore prevents them from occurring. This proactive maintenance approach helps reduce overall costs by maintaining uptime and allowing for more efficient allocation of resources.

## Application Options

### 1. In Track Circuit activated crossings, replacement of ONLY the island circuits with axle counters

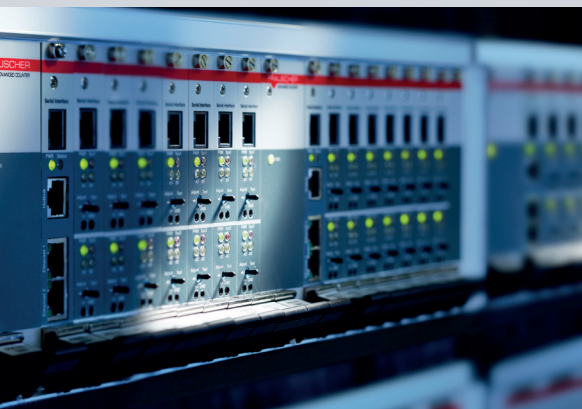
- Island circuits are the most problematic part of track circuit-based crossings, since they easily collect debris and road salt
- In this application, only the island circuit (middle track section) is replaced with 2 sensors (see TS 2 above)

### 2. Full replacement of Track Circuits that activate crossing

- Axle counters can interface with existing grade crossing controllers using the optocoupler, discrete I/O or Ethernet outputs.
- The track circuits in the crossing are replaced for all track sections (TS 1, TS 2 and TS 3 above)

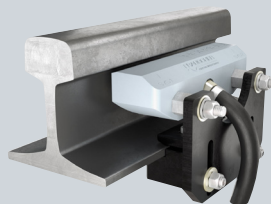
## For Operators, The FAdC System provides:

- A wide range of options for activating, deactivating or resetting crossing protection systems, ensuring safety and high availability
- An indication of the direction from which a train approaches, and the output of track vacancy information to downstream controllers or interlockings via discrete I/O or Ethernet based protocol, reducing overall complexity and costs
- Significantly reduced maintenance for wheel sensors (every 2 years) compared to track circuits
- Optional Counting Head Control (CHC) and Supervisor Track Section (STS) functions provide additional software level protections, increasing availability while maintaining vital SIL 4 operation
- A system that is highly available in all weather conditions, regardless of track/ballast conditions
- The flexibility to be used in the island circuit alone, or for the entire train detection solution in the crossing



## Equipment

- Wheel Sensors RSR180
- Frauscher Advanced Counter FAdC



## Further Information

Find more detailed product descriptions at [www.frauscher.us](http://www.frauscher.us)

- Datasheet RSR180
- Datasheet FAdC