



Application Solution

Frauscher Track Vacancy System FTVS Practical and Unique Use Cases

Over the past decade in the North American rail market, axle counters have come to play an increasing role in train detection. The resilience of axle counter components in unfavorable conditions directly increases uptime, providing a significant benefit to operators. When Frauscher introduced its wheel sensors and axle counting systems, the focus was on vital train detection solutions as an upgrade or replacement for commonly used track circuits, or simple wheel detection for triggering trackside equipment. With the subsequent development of the Frauscher Track Vacancy System FTVS, we are now able to provide solutions that are ideal for non-vital applications where the qualities of an axle counter are desirable. Since its introduction, use of the FTVS has spread to include various practical use cases.

General Switch Protection

- The FTVS is an ideal solution in yards where switches are prevalent and utilized regularly
- Installation in narrow areas around switches is simple compared to installing track circuits in tight spaces
- High immunity to common unfavorable yard conditions such as deteriorated track and ballast, water, snow, ice and electromagnetic interference
- Accurate and reliable protection of switches with a simple design: a wheel sensor is clamped to the rail (no drilling) at the entry and exit points of each track section at each switch; cables then connect the sensors to a junction box as illustrated in Figure 1

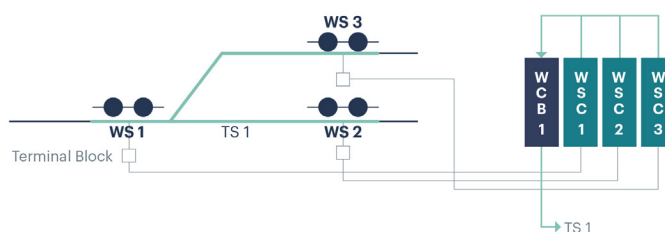


Figure 1: Simple FTVS switch protection model

“Shared Sensor” Solution for Switch Protection

- Increased operator utilization of the FTVS has led to development of new designs that provide additional benefits
- This “shared sensor” solution was designed to highlight the flexibility and increased efficiency of the FTVS
- The sample layout illustrated in Figure 2 shows that wheel sensor 4 is connected to two WSCs. This eliminates the need for a duplicate sensor, thereby reducing the amount of components, wiring and cabling required
- In addition to protecting a switch, the shared sensor solution can create defined track sections between switches for advanced monitoring
- This design allows for interconnection of track sections as opposed to each running as a separate system
- There is significant flexibility as to how the shared sensor system can be designed

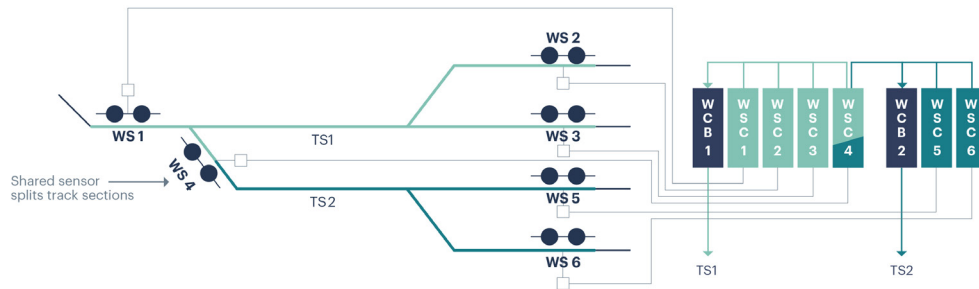


Figure 2: Shared sensor layout (six sensors)

Non-Vital Activation of Warning Devices

- Yards and industrial facilities have many intersections over railroad tracks that are utilized by vehicular and foot traffic
- Even slow speed trains can present a danger to personnel who are distracted or complacent when crossing intersections
- Space, manpower and budget constraints require a unique, simple solution to increase safety
- The FTVS provides a lower cost option that offers quick installation and requires little space or maintenance
- The small footprint design can activate warning device equipment and can be housed in a standard wayside enclosure or in a small box attached directly to a nearby pole
- Simple activation using just one track section is feasible for basic needs, or a more detailed design can be implemented as required. Figure 3 shows a crossing that is designed with several track sections (an island and two approaches) where the FTVS activates gates and lights

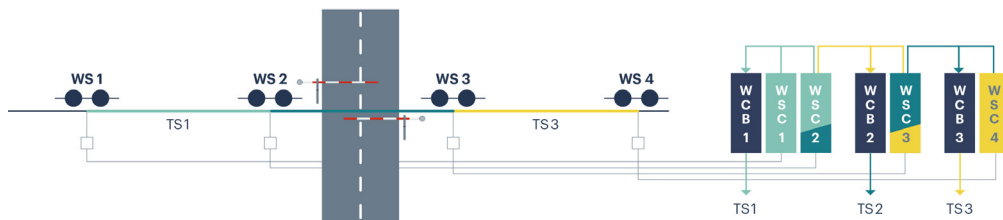


Figure 3: Crossing design with three track sections

End of Track Warning System

- The FTVS system can provide a quick and easy means to activate end of track warning systems
- The sample design depicted in Figure 4 illustrates a two-phase warning system where an audio warning is activated when a train enters TS1, and a visual warning is activated when train enters TS2
- The clear / occupied indication provided by the FTVS is a simple, reliable way to warn trains as they approach the end of the track to prevent a potential derailment



Figure 4: Activation of track warning system with FTVS

Storage Track Vacancy Information

- The versatility of the FTVS also lends well to monitoring storage track vacancy
- As seen in Figure 5, a wheel sensor is placed at the beginning of a track section and will signal as occupied after being traversed, preventing additional cars from entering the section
- The length of track sections can be as long as required to accommodate any rolling stock
- When the FTVS indicates that all sections of a particular track are occupied, operators can direct cars to an alternate track with a vacancy

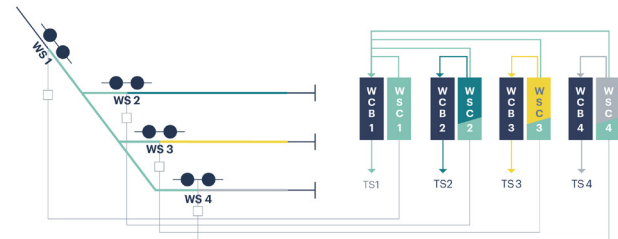


Figure 5: storage track clear / occupied indication

Summary

The Frauscher Track Vacancy System FTVS is a flexible and reliable axle counting system that meets a growing list of train detection needs for non-vital applications. In addition to those highlighted above, requests for new and different solutions are presented to us by our customers on a regular basis. In partnership with them, we fully expect to design many more innovative uses for the FTVS line. Our wheel sensors and axle counters all share the following characteristics:

- Highly immune to disturbances such as floods, snow, ice, deteriorated track and ballast, temperature extremes and electromagnetic interference
- Nearly unlimited track section lengths to accommodate various terrains and layouts
- Quick and easy installation and low maintenance requirements
- DIN rail mounted to fit in small enclosures
- Highly compatible with legacy systems such as track circuits



Frauscher engineers will work with you to imagine and design custom solutions for your train detection needs – from the simplest system requiring just a single wheel sensor to an elaborate system that protects an entire yard or industrial facility.