

## Detect | Protect | Solve



### Trainborne solutions

- Door control and monitoring
  - Position
  - Dual Door
  - Blind Spot Safety
- Protection of integral train systems
  - TPWS
  - HABD
  - WSP

### Trackside solutions

- Protection of monitoring equipment
  - Shock
  - Temperature
  - Vibration
- Safe crossing gates
  - SafeGate
  - Solenoid locking system

## Custom Enclosures

Bernstein Enclosures modified using the Bernstein Custom service are widely used throughout the UK's Rail network in both trackside and trainborne applications.

Die-cast CA Series Aluminium enclosures are used to house a range of trainborne technologies including TPWS, WSP and HABD. Enclosed connections prevent water ingress.



### TPWS & WSP

**Problem:** Mounted to the underneath of trains, regular military connectors can fail due to water ingress

**Solution:** Replace exposed connectors with a customised, enclosed solution from Bernstein, sealed to IP67 and supplied in kit form, ready to install. Can be supplied as part of a continuous tailored changeover plan to deliver minimum downtime and disruption

**Helps to:** Improve a train's safety integrity. Prevent downtime, reducing lost revenue and inconvenience to customers



### HABD

**Problem:** Mounted to the underneath of trains, regular connectors and cables can fail due to water ingress and freezing conditions

**Solution:** Replace exposed connectors with a customised, enclosed solution from Bernstein, sealed to IP67 supplied complete with bracketry, glands, terminals etc and ready to install. Has been supplied as part of a continuous tailored changeover plan to deliver minimum downtime and disruption

**Helps to:** Allows the train to work within its perimeters during cold weather to prevent breakdowns





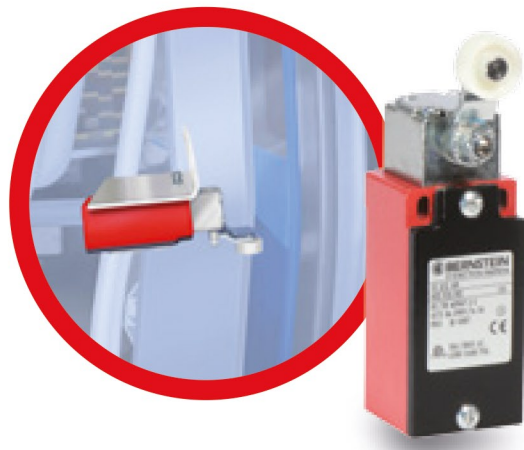


### Position Monitoring

**Problem:** Used within a small aperture on regular operation cycles, the detection switches must perform dependably and comply within trainborne requirements

**Solution:** Use a compact limit switch (Bernstein Ti2 limit switch), with  $3 \times 10^6$  switching cycles and compact 45x30mm dimensions

**Helps to:** Maintain regular working cycles within an everyday environment and avoid any breakdowns



### Dual Door Monitoring

**Problem:** Doors may not close securely if closure mechanism fails when only one door is monitored

**Solution:** Fit secondary monitoring switch with special actuator (Bernstein GC range) to slave door

**Helps to:** Ensure secure closure of train doors. Prevent injury or loss of life.



## Safety Switches and Sensors

Preventing injury and loss of life across the UK's rail network



### Platform Screen Doors

**Problem:** Subject to demanding operation cycles, detection switches must perform dependably and comply with strict platform regulations

**Solution:** Use a positive drive limit switch (Bernstein I88), with 10 x 10<sup>6</sup> operational life expectancy and zero halogen construction (UL94-V0)

**Helps to:** prevent disruption to the widespread operation of the network system



### Blind-Spot Safety Sensors

**Problem:** Trains departing with objects trapped in closed doors (e.g. children's reins)

**Solution:** Fit retroreflective sensor (Bernstein Photoelectric sensor OR20) across door openings to indicate to train drivers if areas are free of obstacles

**Helps to:** Prevent injury or loss of life





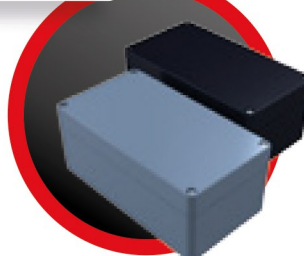
## Trackside Enclosures

Keep sensitive equipment secure and operational

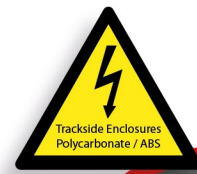
Polycarbonate, GRP and Aluminium Enclosures are used to securely house a range of electrical technologies including Vibration Monitoring, Joint Temperature and Track Temperature Monitoring equipment – providing protection from the elements and vandalism.



- Wide range of colours
- High impact rating
- IP67



- High impact rating
- UL94 - V0 rated
- IP67



- Lightweight
- UV stable
- IP66



## SafeGate

Designed to save lives at rural user operator crossings

**Problem:** Unsecure rural user operator crossings contribute to injury and deaths on the UK's Rail network

**Solution:** SafeGate works by using a solenoid locking safety switch (SLK) to hold the gate closed with an electromagnetic force when a train is detected, preventing users from opening the gate as trains are approaching

**Helps to:** Prevent injury and loss of life



**Switch systems –  
Economy meets safety**



**Sensor systems –  
Compact intelligence**



**Enclosure systems –  
Function and design**

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