

## Pantograph Condition Monitoring System

The pantograph of a train provides an electrical connection between the overhead wiring and the train. Pantograph maintenance has been a long standing issue for overhead electric train networks. Damaged pantographs can cause overhead wiring tear-downs resulting in lengthy network delays and presenting serious safety concerns.

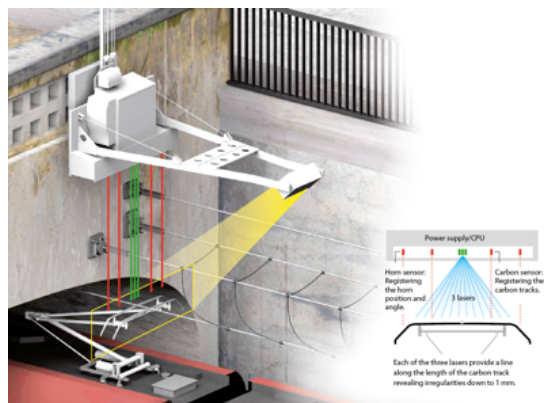
Currently maintenance is performed based on time, which causes unnecessary costs and down time. Current manual inspections of trains are a considerable expense for operators, another aspect which is not accounted for with current methods is unexpected damage occurring during normal operation, it is impossible to predict and is a major cause of wiring tear downs which cause;

- Extensive damage to infrastructure costing millions
- Damage to trains requiring expensive and time consuming repair
- Unsafe live overhead wire in dangerous and uncontrolled locations
- Delays to thousands of commuters which has dramatic economic impacts



### The PantInspect system monitors the condition of the pantographs providing;

- A reduction in maintenance cost whilst simultaneously improving safety
- Analysis of pantographs at operating speeds of up to 180 Km/Hr
- Real time alerts to operators on potentially dangerous conditions which allows for a preventative maintenance scheme rather than a reactive one
- Provide wear measurements to allow for more efficient maintenance schemes to be developed
- Centralised database which allows all sites to be monitored from a single software package in a easy to use graphical environment



## Wheel and Brake Monitoring

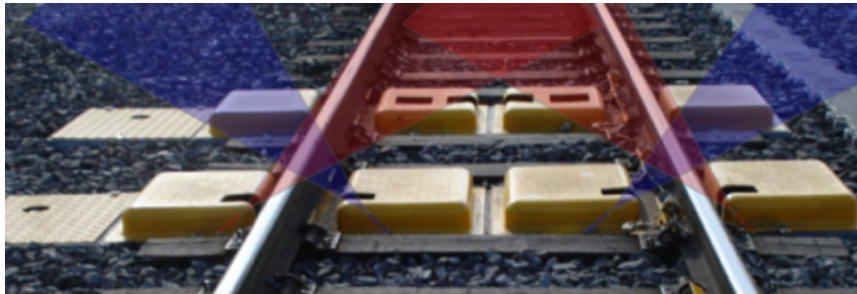
Consumable components such as wheels and brakes on trains require regular inspection by maintenance personnel; it is common for 100% of these safety critical components to be inspected at regular intervals. This task is time consuming and very costly for the operator.



Wheel Flat Spot

Wheel flat spots such as the one above can cause extensive damage to the track that can require replacing the track costing money and causing downtime.

Since the measurements required are repeatable and do not require the removal of components on the trains themselves an automatic measurement system can be utilised to provide more regular, cheaper and more reliable measurements.



### The Delta Rail's Modular VIEW system measures critical parameters of the wheels and brakes which;

- Greatly reduces maintenance staff load by removing the need for manual inspections
- Minimises the effect of human error
- Detects defects before they cause major damage to the tracks and trains
- Allows for longer periods between replacing components without compromising on safety or reliability providing dramatic savings in maintenance
- Detects missing components such as mounting bolts to prevent catastrophic failure of safety and mission critical systems

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