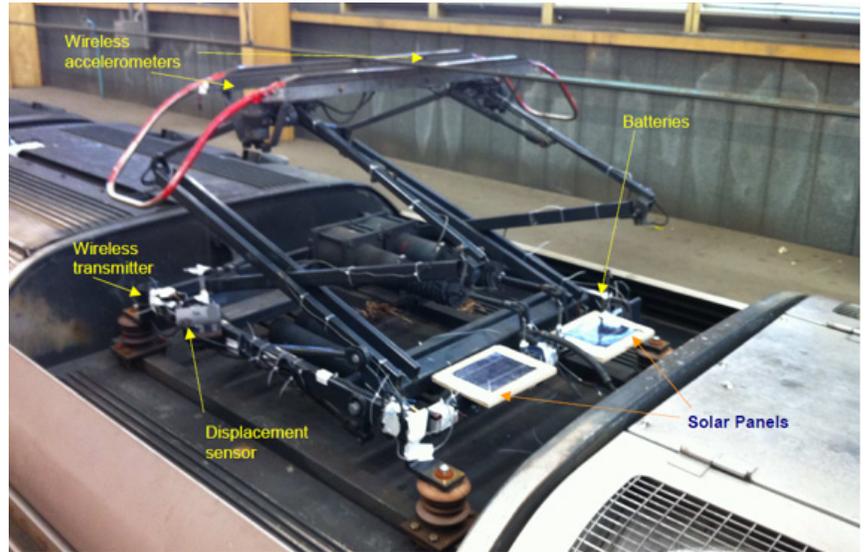


# Pantograph-Overhead Wiring Monitoring

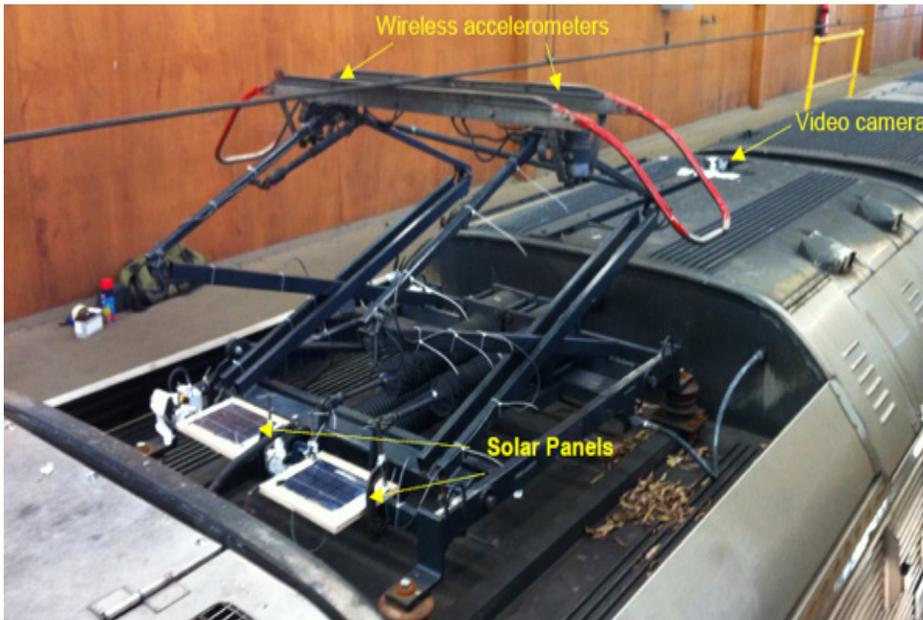
## MicroStrain Wireless Sensors help Sydney Trains stay safe

**The testing team:** Sydney Trains Rolling Stock and Mechanical Design (RSMD) have used MicroStrain products in multiple applications as a means to wirelessly capture sensor data particularly where electrical safety is a concern. RSMD designed and tested an experimental monitoring system as part of a strategy to better manage a series of incidents concerning pantograph and overhead wire (OHW) infrastructure in previous years.



### The Experimental Monitoring System measurements:

- Dynamic wire heights across the network under the uplift force of pantograph
- Acceleration levels in the pantograph head due to interaction with the OHW and impacts against other supporting infrastructure
- Video footage of the measured pantograph under the OHW
- GPS data with train speed and geospatial coordinates.



### The instrumentation:

- Wireless tri-axial accelerometer (GLink)
- Potentiometric displacement transducer (VLink)
- Battery packs for wireless transmitters and solar panels for trickle charging
- Wireless base station receivers with roof-top antennae (WSDA-Base-101)
- Video camera with IR LED illumination for tunnels, overbridges and night time monitoring
- GPS mouse



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# MicroStrain Wireless Application note: Sydney Trains



Monitor screenshot of detection of low-wire-overlap

The monitoring system was mounted on the frame supporting the pantograph; which is directly in contact with the OHW and energised at 1500V. By using MicroStrain products, the setup was completely wireless thus improving safety of the overall monitoring system. With the capabilities of wireless telemetry, significant complications were avoided with isolation of high voltage train components from low voltage monitoring equipment. This led to successful trials which were able to identify problem areas on Sydney Trains network as seen above, where a low wire overlap ran off the end of the pantograph horn.



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