

Overview

Transmission Dynamics® has developed the PANDAS-3R® — a ground-breaking solution for third-rail asset health monitoring. Our ultra low-powered PANDAS Wireless Accelerometer (WA) transmitters, mounted on the shoe gear, paired with our Receiver and Signal Relay Unit (RSRU) Gateway provide near-instantaneous alerts of critical impact events sent via email and/or SMS, ensuring stakeholders stay informed.

The PANDAS WA is a 3-axis; high bandwidth accelerometer containing a 3-axis gyroscope, temperature sensor, complete wireless connectivity, advanced ultra-miniature battery technology, and advanced internal processing capability. The 3-axis accelerometer will trigger following exceedance of a pre-determined threshold.

It communicates locally with a undercarriage-mounted RSRU (Receiver and Signal Relay Unit), that transfers the acquired data to the Cloud. The data is made available to the client on the secure GDN® (Global Data Network®), where it can be viewed and exported remotely by the client.

Once triggered, a report detailing the event (including GPS coordinates, impact magnitude, vehicle speed, and direction) allows maintenance staff to pinpoint problematic locations in the third rail infrastructure, enabling proactive servicing.

The PANDAS-3R® system can be seamlessly incorporated into existing rail systems with minimal engineering modifications. User-friendly installation without the need for extensive technical expertise minimises installation time. It can also operate for two and a half years between battery changes. These features mean that rail operators can efficiently implement PANDAS-3R®, making it a cost-effective and practical solution for improving third-rail infrastructure monitoring while maintaining operational continuity.

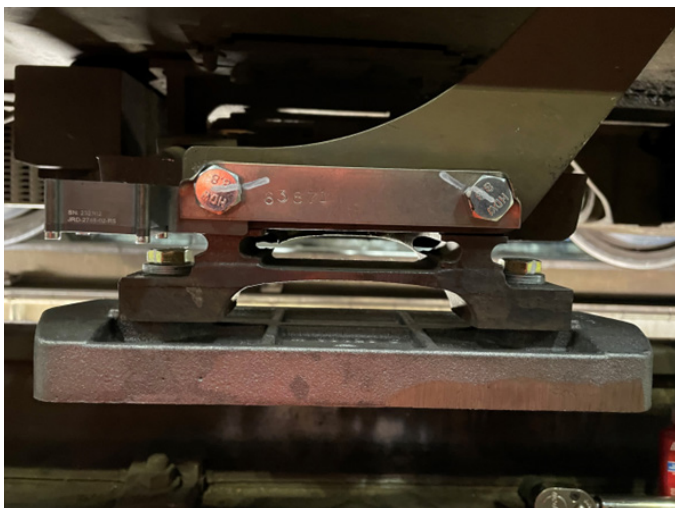


Figure 1. Wireless Accelerometer mounted on shoe gear

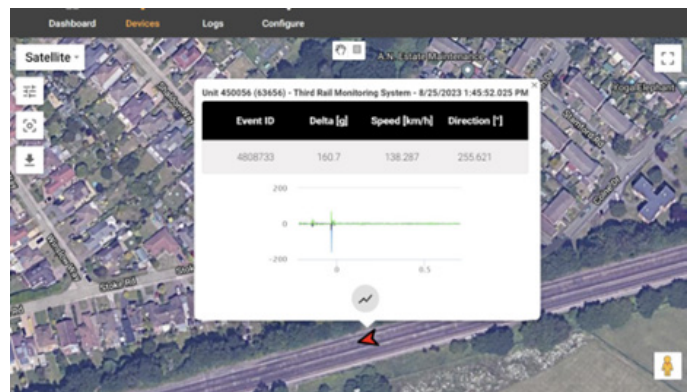


Figure 2. Example of impact event



Figure 3. Undercarriage-mounted RSRU

Accelerometer

Communication	Licence-free frequency range of 2.4 GHz
Range	30 m (open space)
Power	Replaceable 3.6 V battery
Life	2 years per battery cycle
Size	Typically 40 x 20 x 25 mm (excluding mounting bracket and pantograph design dependent)
Weight	Typically between 60 - 125 grams
Temperature	-40 °C to + 85 °C
IP Rating	IP69K
Logging Modes	Events mode (trigger adjustable) Flip detection (trigger adjustable) Time domain mode (adjustable)
Sampling Rate (Events mode)	400 Hz (0.36s pre; 1.46s post trigger) 800 Hz (0.18s pre; 0.73s post trigger)

Accelerometer Testing Standards

Conducted Emissions	EN55016-2-1:2014
Radiated Emissions	EN55016-2-3:2010
Shock and Vibration	EN 61373:2010
Electrostatic Discharge	EN61000-4-2:2009
Radiated Susceptibility	EN61000-4-3:2006
Fast Transient Burst Susceptibility	EN61000-4-4:2012
Surge Immunity	EN61000-4-5:2014
Conducted Immunity	EN61000-4-6:2014



Figure 4. PANDAS Wireless Accelerometer

Transceiver

Communication	Licence-free frequency range 2.4 GHz GSM license-free frequency range 80 MHz to 2 GHz GPS
Power	24V DC, 10 W
Size	179.6 x 105.0 x 75.2 mm
Weight	0.65 kg
Temperature Range	-40 °C to +85 °C
IP Rating	IP67
Warranty	12 months

Transceiver Testing Standards

EMC and EMI compatibility	BS:EN 50121-3-2:2016 BS:EN 301489-1 V2.1.1 BS EN 301-17 V3.2.0
Environmental suitability	BS:EN 50155:2017
Shock and Vibration	BS:EN 61373:2010

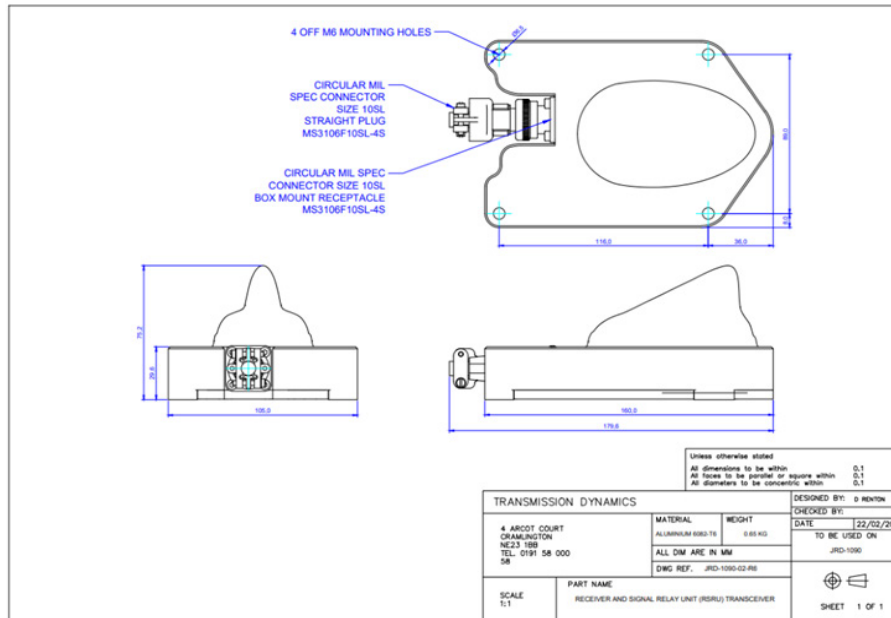


Figure 5. RSRU transceiver

RSRU Transceiver Dimensions

Model

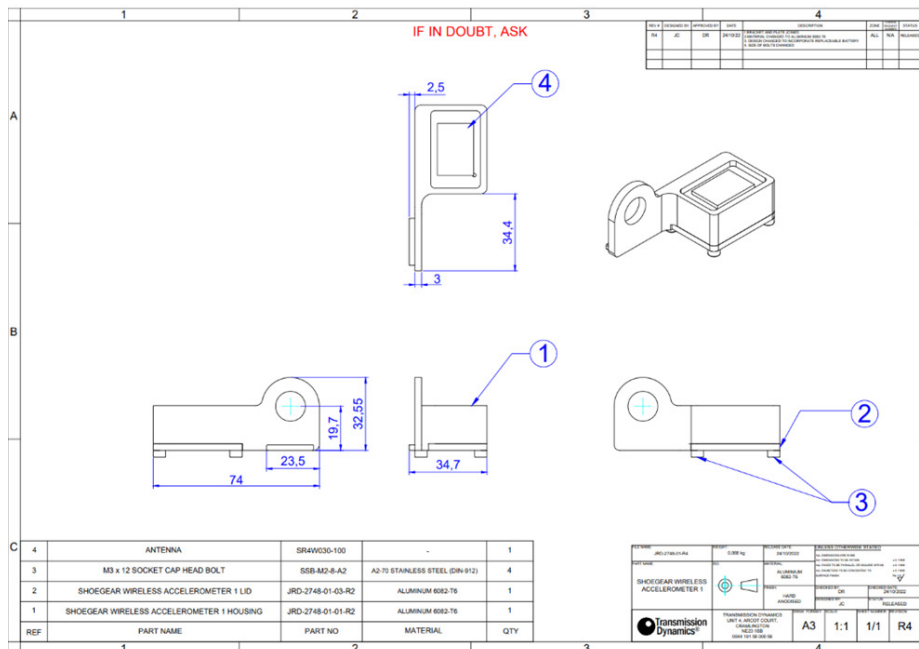
JRD-1090-02-R6



Shoegear Wireless Accelerometer 1 Dimensions

Model

JRD-1090-02-R6



Shoegear Wireless Accelerometer 2 Dimensions

Model

JRD-2784-02-R4

