

-Railway vehicle (pantograph) development and quality management-

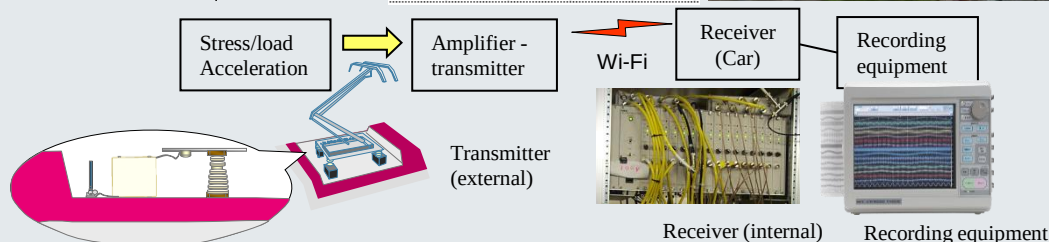
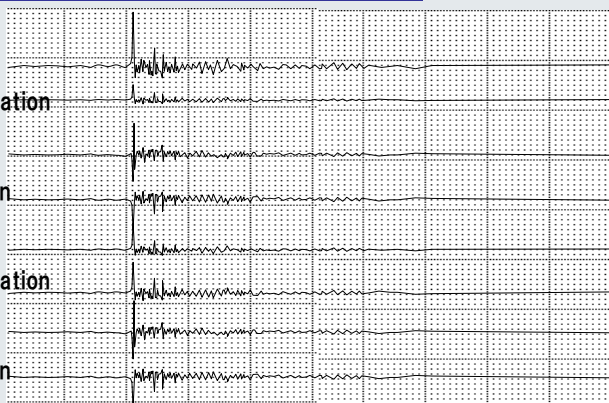
Pantograph behavior testing

Ensuring power to high speed railway vehicles is crucial. Analysis of pantograph behavior leads to improved safety and reduced energy usage.

- The biggest challenge to increasing the Shinkansen to 360 km/h is suppressing noise. New technologies are being developed to reduce noise and prevent lost connection to overhead lines. Low noise pantographs, pantograph noise insulation boards and lower body noise absorbers were developed as noise suppression technology.
- The AS1803R AC strain amplifier and RA2800A digital oscillographic recorder are used to determine the causes of disconnection and noise by measuring stress, vibration and tension on the pantograph during high-speed train tests.

Pantograph contact condition

Overhead line no1 / vibration
 Auxiliary overhead line no1 / vibration
 Hanger no1 / strain
 Trolley line no1 / vertical vibration
 Overhead line no2 / vibration
 Auxiliary overhead line no2 / vibration
 Hanger no2 / strain
 Trolley line no2 / vertical vibration



Contact loss between pantograph and contact plate

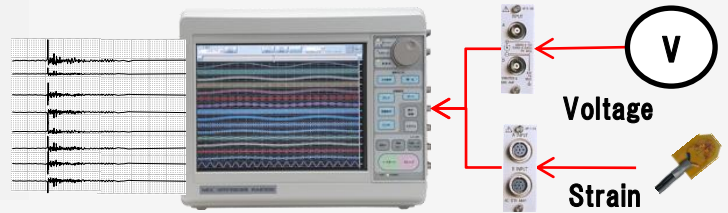
The two main factors affecting the current collection performance of the pantograph are the pantograph movement performance and wear performance between contact plate and overhead line. A contact plate is attached to the top of the pantograph which is in contact with the overhead line. However, if the pantograph cannot follow the overhead line well and the contact plate loses contact with the overhead line a large current arc may generated or good current collection may be inhibited. These arcs increase friction to both the contact plate and overhead wire and in the worst case can destroy both. In order to prevent this, it is important that the pantograph follows the vertical displacement of the overhead line even at high speeds.

Digital Oscilloscope Recorder

RA2000A Series Omniace III

Did you know?

The RA2300A/RA2800A can simultaneously measure voltage, current, control timing, vibration, rotation, pressure and more directly from sensors. Recorded data can be converted to csv data or used in FFT analysis by using computer software.



Item	Item code	Spec
2CH High Resolution Amp	AP11-101	$\pm 100\text{mV} \sim \pm 500\text{V}$, A/D res 16bit 10 μs
2CH High Speed Amp	AP11-103	$\pm 100\text{mV} \sim \pm 500\text{V}$, A/D res 12bit 1 μs
Event Amp	AP11-105	Input: 8 logic (Voltage/Contact)
2CH TC·DC Amp	AP11-106A	Input: R·T·J·K·W ($\pm 100\text{mV} \sim \pm 50\text{V}$)
2CH AC Strain Amp	AP11-104A	Response frequency: 2KHz
2CH DC Strain Amp	AP11-110	Response frequency: 50KHz
2CH Vibration/RMS Amp	AP11-109	$\pm 100\text{mV} \sim \pm 500\text{V}$
F/V Converter	AP11-108	Input: 1KHz $\sim$ 10KHz

