



TechRentals

## Vehicle Condition Monitoring System

TechRentals has developed a condition monitoring system to measure the lateral and vertical acceleration experienced by railway vehicles. This enables not only track problems to be identified but also enables the vehicle performance itself to be evaluated on a comparative basis. The system was developed particularly for railway use however the system has potential for use in any analogous transport system.

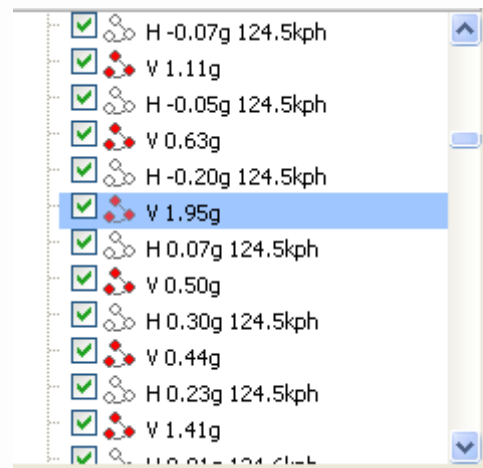


The system is based on a GPS system updated at a 10Hz rate with measurements provided by a triaxial accelerometer. The physical implementation is quite simple and all that is required is for the measurement apparatus to be placed in the vehicle for the duration of the journey. The data is transferred to a memory card with the output subsequently processed to create a unique output format that utilizes Google Earth data as a reference. This output format clearly shows track abnormalities and also allows the responsible staff to compare the performance of different rail vehicles across the same section of track. The presentation is such that the concept and operation can be understood with the briefest of training.

The image in figure 1 shows a significant problem highlighted by the magnitude of the red and white line deviations. The red is the vertical and the white is the horizontal movement. The location of the problem is readily identified very accurately using GPS coordinates, etc.

In figure 2 we have a typical log which allows the magnitude of the movements to be easily determined together with the speed, etc. This shows a vertical acceleration of between 1.95g and .44g. The horizontal was -.2 to .3g horizontally at a speed of 124.5kph. The log is continuous allowing further analysis.

The instrument will also provide histograms that summarize the horizontal and vertical vibration performance of the vehicle for different speeds. This enables different vehicles to be compared across the same piece of track.



The system allows extensive routine measurements to be taken without the use of specialised measurement vehicles at the actual service speeds using standard vehicles. There is no disturbance to normal track operation. Apart from passenger service customer comfort there are savings by minimising track damage and establishing optimum vehicle speeds.



There is the potential to investigate a relationship between vehicle design or adjustment, freight loads, and speed with a view to gaining the maximum long term handling capacity from existing track. The cost savings from such an investigation can be substantial.

**For more information contact:**

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