High Speed Train Wireless Sensing
Sensing Systems for Improved Maintenance, Tracking, and Safety

In-Service Fleet Sensing Capabilities
Maintenance and service is a key contributor to the total cost of high speed train ownership. While high speed rail often costs over $10,000,000 per mile to construct, the ongoing maintenance and operation cost can approach $200,000 per mile of track annually. (New York Times, 2009) LORD MicroStrain® wireless sensing systems provide fleet operators with a quick and cost-effective path to embedding health sensing capabilities on both critical components for new and existing rolling stock for continuous, automated condition updates.

The elimination of wires facilitates the easy retrofit of active engines and cars. LORD MicroStrain scalable wireless sensing networks provides a range of sensing capabilities on distributed components. Solutions include wireless vibration sensors, wireless load sensors, wireless strain sensors, and wireless temperature sensors on bogies, wheels, brakes, and axles; miniature inclinometers and inertial sensors for feedback car positioning and dynamics; high-value asset and cargo health tracking. Specifically, LORD’s wireless systems enable condition monitoring of distributed rail health directly from the bogies of in-service trains. As a result, operators can monitor track and infrastructure safety without servicing redundant, non-revenue generating rolling stock.

LORD’s lossless LXRS® wireless communication with extended range ensures reliable data transmission on dynamic components, while low power consumption and energy harvesting significantly reduce or eliminate battery maintenance in long-term applications.

Real-Time Remote Monitoring
Combined with SensorCloud™ remote network monitoring and management, LORD MicroStrain provides an end-to-end sensing solution that delivers real-time actionable information. Embedded analytics and customizable alerts allow users to define their key thresholds and receive automated messages about remote train health via satellite or cellular modem. MathEngine® web-based analytics provides a robust scripting environment for programming new or porting in existing prognostic algorithms. As a result, operators can schedule maintenance and anticipate part replacement before failures occur, and track fleet movement and cargo health for optimized fleet operation and service costs.