

ASTRONICS

TEST SYSTEMS

Ensuring PTC Reliability with Astronics Test Systems

The R8200 helps rail operators ensure PTC safety compliance and optimal performance, writes Steve Fairbanks, Senior Director New Business Development and Government Solutions, Astronics Test Systems.

The implementation of positive train control (PTC) marked a pivotal advance in US rail regulation. Mandated by the 2008 Rail Safety Improvement Act, this transformation in rail safety technology emerged from a series of tragic accidents that highlighted critical safety gaps in America's rail network.

The act's passing followed several high-profile incidents, most notably the 12 September 2008 Los Angeles collision between a Metrolink commuter train and a Union Pacific freight train that claimed 25 lives and injured over 100. This tragic event, caused by the commuter train's driver running a red signal, became the catalyst for comprehensive rail safety reform.

PTC automatically prevents train accidents caused by human error, including collisions, derailments and unauthorised movements. Using a network of radios on trains, wayside equipment and base stations, PTC ensures real-time tracking of all railcars while maintaining constant communication between systems and operators. It can detect excessive speeds, misaligned switches and unauthorised train movements, automatically applying brakes when necessary to prevent accidents.

The implementation of PTC represented one of the largest and most complex safety programmes in US rail history, facing numerous technical challenges and



deadline extensions. In total, more than 11 billion USD was invested into development and installation costs.

Today, PTC operates across more than 57,000 miles of track mandated by the Federal Railroad Association (FRA), covering crucial freight and passenger routes. Since its implementation, the FRA has documented a significant reduction in preventable accidents, particularly collisions and overspeed derailments.

Maintaining PTC Effectiveness

With PTC now fully operational, the industry's focus has shifted to ensuring its continued reliability. The system's effectiveness – beyond meeting Federal Communications Commission (FCC) mandates – depends entirely on the proper functioning of each component. A single malfunctioning radio can compromise the entire safety system, returning operators to complete reliance on human vigilance.

Regular testing has become imperative for transport authorities to verify their PTC systems are fully functioning, FCC-compliant and operating at peak safety levels. This is where **Astronics Test Systems** can help with its specialised solution.

A Legacy of Innovation in Rail Testing

Astronics Test Systems brings over four decades of expertise in transportation testing solutions to the rail industry and today serves more than 80% of US rail car builders, transit authorities and OEMs.

Its comprehensive understanding of rail operations and safety systems has been built through partnerships with major rail operators across North America, Europe and Asia.

This global experience has informed the development of its testing solutions, ensuring they meet the diverse needs of modern rail operations.

The R8200

Building on this extensive expertise, Astronics offers the **R8200** land mobile radio service monitor designed specifically for PTC applications. This portable unit offers a comprehensive solution for testing all three PTC radio applications – onboard, wayside and base station units – ensuring compliance with manufacturing specifications and FCC certification requirements.

The R8200 combines comprehensive digital and analogue land mobile radio (LMR) testing with the ability to measure important radio frequency (RF) network characteristics such as return loss, voltage

standing wave ratio (VSWR) and phase. This enables your two-way technician to carry one portable instrument rather than two – making their job easier, freeing space in the van or bench and also **saving thousands in equipment costs**.

The R8200 is an out-of-the-box solution, with applications for the majority of radio vendors already in place. Simple to use, with a straightforward graphical user interface (GUI), it's just a case of pulling up the application for the radio you wish to test and hitting the go button. This simplicity means you don't need a specialist radio engineer to understand what's happening, your regular inspector can easily pick it up and start testing.

Advanced Features

The unit comes with a range of advanced features including Astronics' proprietary 'Dual-Display' showing the carrier and modulation scope on the same screen, a cable fault locator and tracking generator.

This provides an integrated instrument that sets up the RF generator in a sweeping mode that's lock-stepped with the spectrum analyser. Its dynamic range and response time provides an invaluable tool for measuring and servicing RF filtering and combining networks like intermediate frequency (IF) filters and duplexers, and the unit also has a low spectrum analyser noise floor of well below -140 decibel milliwatt (dBm) at narrow spans.



The R8200's software-based architecture also allows for field upgrades and additional feature integration, making it a futureproof investment. As testing requirements evolve or new protocols emerge, users can easily expand the system's capabilities through software updates, ensuring long-term value for rail operators.

Industry Support and Reliability

As the FRA moves to tighten PTC operational requirements following reports of unexpected system-level outages, rail operators face new challenges in managing PTC reliability. The proposed rules underscore the importance of consistently functioning PTC across all operating conditions. Astronics' R8200 radio service monitor offers a timely solution, empowering rail operators to detect and resolve PTC system faults more efficiently. With the R8200's ability to test radio functionality on-the-go, operators can ensure that each component is operating at peak performance and swiftly address failures, aligning with the FRA's evolving safety expectations. This forward-looking approach from Astronics supports

both compliance with current standards and readiness for emerging regulatory requirements.

With Astronics' proven track record and ongoing commitment to innovation in rail testing, operators can trust in a solution that meets today's needs while preparing for tomorrow's challenges.

Get in Touch!

To find out more about the **R8200**, or the other ways **Astronics Test Systems** can support your organisation's PTC validation, please visit **ASTRONICS TEST SYSTEMS | PTC** or contact:

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Ensure Reliable
Operation of your
PTC Systems
with the **R8200**
Communications
System Analyzer

The only service monitor able to test both
PTC-ITCR and PTC-ACSES protocols



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