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 Data & Information

Syntony GNSS

Solution for Positive Train Control (PTC) at Milwaukee Thanks to Underground GPS Signals

Thick station canopies often block GPS signals, depriving trains and users of navigation, speed and timing information

Positive train control (PTC) regulation is led by the Federal Railroad Administration (FRA), the agency within the Department of Transportation responsible for overseeing and regulating the railway sector in the USA.

Such a framework has been created for avoiding collision of trains, over-speed derailments, incursions into established work zones (including railway tunnels and stations), and movements of trains through switches (points) left in the wrong position.

However, the reception of GPS signals into GPS-denied areas (undergrounds, tunnels, train

stations, highly urban areas, etc.) can be a blocker for PTC, which requires reliable GPS signals to obtain precise information on train location and speed as well as on time.

Thus, the lack of GPS signals in these areas has been so far meant that the rail industry has felt it was impossible to fully embrace such a legal framework, causing it to

expose itself to potential fines and increased operating costs from temporary fixes.

In response to that, Syntony GNSS and CANADIAN PACIFIC RAILWAY are now equipping the Milwaukee (WI) train station with SubWAVE™ technology, leading to the deployment of GPS signals in GPS-denied areas.

Thanks to such a system, each GPS-denied area can now be covered with GPS signals with the exact same parameters as those outside.

This first case study will be followed by other train stations in the USA in order to continuously help the railway sector to be compatible and responsive regarding the positive train control framework.

About SubWAVE™

SubWAVE™ is a GNSS* simulator operating in real-time, which uses existing telecom infrastructures to broadcast synthetic GNSS signals

This GNSS coverage extension provides a seamless transition for receivers coming in or out of equipped tunnels, ensuring a GNSS coverage extension to every GNSS-based service (location, navigation, time synchronisation, etc.).



The SubWAVE™ GNSS simulator can be plugged into the telecom network to provide GPS coverage extension

Since GNSS is the universal standard of location technologies, third parties can benefit from the coverage as well. Therefore, emergencies can be located with precision, and rescue forces can optimise their response time by knowing the exact location of incidents, and even use navigation services to get there by the shortest route.

Watch the video demonstration of the seamless GPS coverage

transition when entering a SubWAVE™-equipped road tunnel in Stockholm, Sweden, using a common navigation app on a standard smartphone.

**GNSS stands for Global Navigation Satellite System (like GPS, Galileo, GLONASS, etc.). Those satellite systems, or constellations, provide positioning, navigation, and timing information (PNT) for users all around the globe, and most location services are based on their signals.*





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✉ contact@syntony.fr

☎ +33 (0)5 81 31 99 19



For more information, you can visit solutions.syntony-gnss.com/gps-coverage-extension-rail or scan the QR code.

Seamless and Universal GPS Coverage Extension

SubWAVE™ for Rail

- ✓ Seamless transition between outdoor and underground
- ✓ Compatible with existing equipment (P25, TETRA, etc.)
- ✓ GPS-based timing synchronization enabled indoor

and also

- ✓ PTC GPS Initialization inside train stations



For more information,
scan this QR code



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