

When precision matters.

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## Railway

With the growing availability of more Global Navigation Satellite Systems (GNSS), the proliferation of GNSS signals (including L2C and L5), and the lowering costs of precision, there is significant opportunity for railroad operators to increase the safety and reliability of their systems.



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Railroad operations subjects GNSS systems to the most varied operating environments. Through the transit of a single train, the GNSS system is exposed to changing weather conditions, interfering RF signals, vibration and shock, as well as reduced exposures to the sky, to name a few. GNSS antennas must have the robustness to reliably operate in all environments; in particular protecting against intermodulation and saturation caused by high level cellular 700MHz signals.



In the USA, Positive Train Control (PTC) and Positive Train Location (PTL) is taking advantage of the increasing precision of GNSS systems. GNSS provides the ability to determine the direction a train is oriented, even while it is stopped, which track it is on, and speed of travel. All of these measures are essential for PTC and PTL. Tallysman has the experience and tools to assist you in avoiding potential problems and select the ideal antenna for your situation / application.

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# Why is Tallysman a Supplier to Class 1 Railways?

With a wide range of high quality GNSS antennas and deep expertise, Tallysman can support the successful implementation of any GNSS system for rail.



AAR Certified GNSS Antennas



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#### **Locomotives and Hi-Rail**

#### Value of a GNSS System

- Key component of a Positive Train Location System
- Increase positioning accuracy of trains and vehicles
- Identify train or vehicle orientation on the track
- Improve safety and productivity

#### **Tallysman GNSS Antennas**

- AAR-compliant quality
- European Rail Certified
- Strong filtering of out of band signals
- Tight Phase Centre Variation

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#### **End of Train Devices**

#### Value of a GNSS System

- Ensure safety by remotely confirming when the end of a train has cleared the main line onto a siding
- Improve productivity by reducing the distance between trains

Potential to platoon trains

#### Tallysman GNSS Antennas

- Custom-tuning for embedded antennas
- Strong filtering of out of band signals, ensures reliable positioning
- Tight Phase Centre Variation

#### Trackside Reference Stations

#### Value of a GNSS System

- Achieve centimetre-level positioning with a network of trackside reference stations
- Ensure accuracy of the entire GNSS system
- Enable high precision and integrity provided by RTK /PPP systems

#### **Tallysman GNSS Antennas**

- Tight Phase Centre Variation ±1mm
- Easy to install
- All GNSS signals and constellations supported

#### Wearables

#### Value of a GNSS System

- Gain accurate awareness of a worker's location
- Ensure safety with potential to alert workers of an approaching train

#### **Tallysman GNSS Antennas**

- A small and lightweight form factor
- Easy three screw attachment
- Low axial ratio, providing high immunity to multi-path signals



# TALLYSMAN<sup>®</sup>

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#### Locomotives and Hi-Rail

Tallysman TW3972 has met , and exceeds, the rigorous environmental standards of the AAR. The TW3000 family and Tallysman's new VeroStar family of antennas are ideal for use on Hi-Rail equipment.



#### Wearables

Tallysman TW9000 family of "button" antennas are ideal for placement on hardhats or other garments of trackside workers.



#### **Trackside Reference Stations**

Tallysman offers the highest precision GNSS antennas for use as trackside reference stations. These are essential to achieve centimetre level positioning accuracy of position. Tallysman's VeraPhase antenna is easy to install and offers a high degree of accuracy.



#### **End of Train Device**

Tallysman also offers a wide range of embedded antennas which can be integrated in ETDs to enable the potential of achieving centimetre level accuracy so you can be confident of the location of the end of your train.

Product	Frequencies	L-Band	Туре	Weight (g)
TW3972	L1/L2/L5, G1/G2/G3, E1/E5, B1/B2		Housed patch	185
TW9829	L1/L2, G1/G2, E1, B1	×	Housed patch	50
VP6300	L1/L2/L5, G1/G2/G3, E1/E5, B1/B2		Crossed Dipoles	52
TW1889	L1/L2, G1/G2/G3, E1/E5b, B1/B2		OEM patch	37
VSP600L	L1/L2/L5 G1/G2/G3, E1/E5/E6, B1/B2/B3, QZSS L6		Crossed Dipoles	500



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