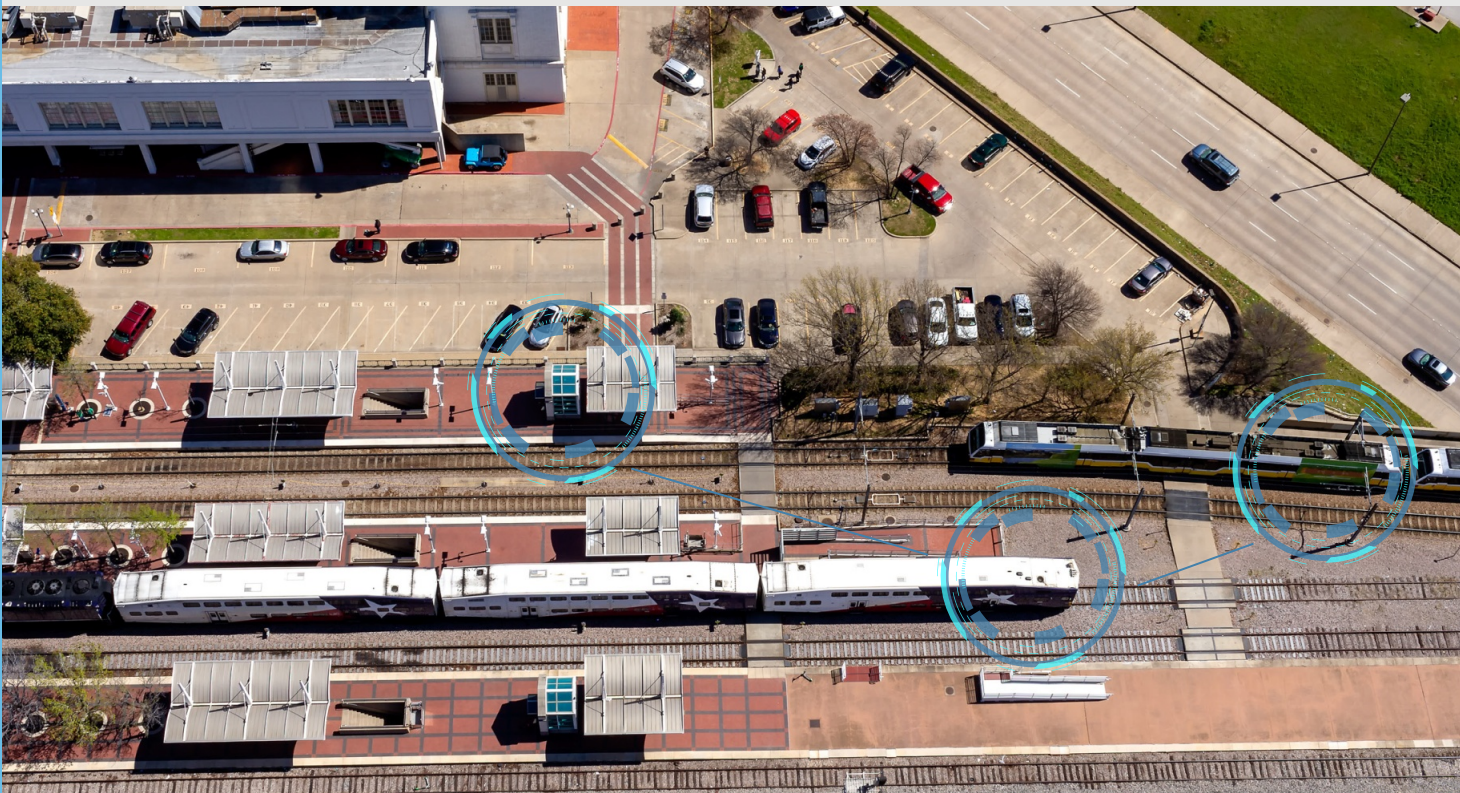


GNSS For Rail Application



Step Global provides specialized GNSS solutions for rail applications, enabling precise positioning, navigation, and optimized performance in railway systems. Elevate your rail operations with Step Global's reliable and advanced product offerings.

Why use GNSS on Rail?



Main lines

- Train signalling and interlocking (PTC)
- Enforced line speed (PTC)
- Brake control

Regional lines

- On-Board speed monitoring
- Moving block management
- End-of-line stop limits.
- Wayside hazard detectors



Tramways

- Contextual Speed Control
- Adjacent track discrimination
- Accurate stops at platforms
- Accurate stockage
- Traffic light priority
- Real time passenger information

Freight

- Train composition
- Train separation alert
- Automatic handling in marshalling yards



Infrastructures

- Preventive maintenance
- Railroad worker protection
- Improved logistics

The use of GNSS in railway systems presents many advantages, in particular the monitoring of the trains exact location, logistic information management, enhanced train signaling (which improves safety, but also reduces distances between trains and increases train frequencies), and the possibility to map the transport infrastructure.

GNSS Products for Rail

TRIMBLE HIGH-PRECISION MAXWELL™ 7 L1, L2, L5, E6 MODULES



Trimble BD992-INS

The BD992-INS is a dual-antenna receiver with an integrated inertial navigation system, That supports position and orientation at high update rates.



Trimble BD992

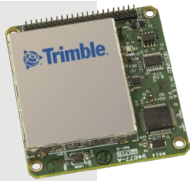
The Trimble BD992 dual-antenna, single board solution for precise position and heading.



Trimble BD990

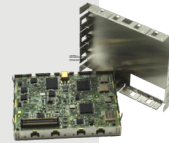
The BD990 is a triple-frequency receiver for all GNSS constellations.

TRIMBLE HIGH-PRECISION MAXWELL™ 7 L1, L2, L5 MODULES



Trimble BD940-INS

The BD940-INS is a triple-frequency, multi-constellation, reduced size GNSS/INS solution. Compact size and centimeter-level accuracy supports mobile, robotic, and airborne applications.



Trimble BD940

The BD940 is a triple-frequency, high-precision GNSS receiver that is very compact to allow for integration into tight spaces.



Trimble BD920

The BD920 is a dual-frequency L1/L2 or L5 field-switchable GNSS receiver with integrated MSS-Band to support Trimble RTX service.



Trimble BD920S

The BD920S is a dual-frequency L1/L2 or L5 field-switchable GNSS receiver with integrated S-Band frequency to support the Indian Regional Navigation Satellite System, NavIC.T

TRIMBLE HIGH-PRECISION MAXWELL™ 7 Rugged Enclosed Receivers



Trimble BX940

The BX940 receiver enclosure is an integrated GNSS-Inertial engine delivering high accuracy GNSS, DGNSS positions in the most challenging environments powered by the BD940-INS.



Trimble BX992

The BX992 is a dual-antenna receiver enclosure with integrated inertial navigation system powered by the BD992-INS.

GNSS Products for Rail

TRIMBLE SMART ANTENNAS



Trimble AX940i

A compact and easy-to-install high-precision GNSS smart antenna with an integrated receiver contained within a sleek enclosure, built-in inertial sensors and WiFi and Bluetooth



Trimble AX940

A compact and easy-to-install high-precision GNSS smart antenna with an integrated receiver contained within a sleek enclosure.

TRIMBLE HIGH PRECISION & RUGGED ANTENNAS



Trimble Zephyr 3 Base

With its integrated Stealth™ resistive ground plane at the top of the Zephyr range with maximum multipath mitigation, this is the antenna of choice not just for all RTK Reference Stations but also for Rover applications in highly reflective reception environments.



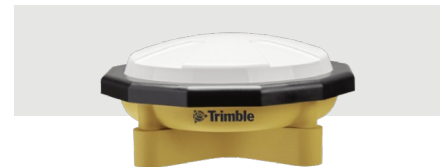
Trimble Zephyr 3 Rover

A high-performing lightweight GNSS rover antenna optimized for precision RTK and roving applications. The Zephyr Rover minimizes multipath and offers robust low elevation tracking and millimeter phase center repeatability.



Trimble GA830

The Trimble GA830 antenna is designed to support centimeter-level accuracy for rugged land and marine applications.



Trimble Zephyr 3 Rugged

Designed for applications in high shock and vibration environments like machine-control up to 75g shock and 20.4g RMS, the Zephyr Rugged is available in two versions with 5/8" mast mounting and with 3" mast clamp

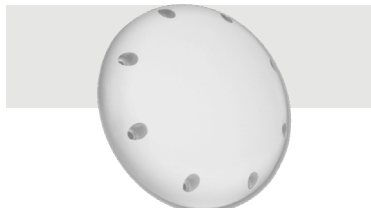


TRIMBLE VEHICLE MOUNT ANTENNAS



Trimble LV59

The LV59 is a highly robust antenna with an all-aluminum base for 5/8" thread mount, equipped with sub-centimeter phase center accuracy and superior signal tracking of current and near-future GNSS signals for land and marine applications.



Trimble AV59

The AV59 is a highly robust antenna with rugged 8-hole bulkhead mounting with rubber o-ring sealing for aerial, land, and marine applications. It offers sub-centimeter phase center accuracy and superior signal tracking of current and near-future GNSS signals.



Trimble LV59

The Trimble AG25 antennas are designed to support centimeter-level land platforms like agriculture and logistic vehicles.

TRIMBLE SMALL FORM FACTOR ANTENNAS



Trimble AV28

A precise triple-frequency, L-band antenna suitable for a wide range of applications where the weight and size really matter.



Trimble AV17

A helix based, triple-frequency L-band antenna ideal for UAV applications due to its lightweight, small form factor and low power consumption design.



Trimble AV16

A helix based, dual-frequency antenna ideal for UAV applications due to its lightweight, small form factor and low power consumption design.

HARXON GNSS SMART ANTENNAS

Smart Antenna TS112 PRO



- Multi Frequency, Multi-Constellation, Integrated Antenna Receiver
- Ultimate Positioning Accuracy
 - Comprehensive GNSS Support for Robust Positioning Performance
 - GLIDETM Positioning Technology
 - STEADYLINE® Smooth Positioning
 - Terrain Compensation for Maximum Accuracy
 - Rich Interfaces for Flexible Connectivity
 - Ruggedized and Durable Design, Flexible Installations Available

Smart Antenna TS112 PRO



- Multi-Constellation, Integrated Antenna Receiver
- Multi-Constellation for Advanced Secure Positioning
 - Multi-point feed-in design to achieve greater phase centre stability.
 - Bluetooth, built-in/external radio transmission modems
 - GPS, GLONASS, BeiDou, Galileo, for simultaneous satellite tracking to offer RTK positioning.

VEHICLE COMBINATION ANTENNAS



HX-AUST002

HX-AUST002 seamlessly integrates multi-constellation multi-band GNSS antenna, consistent V2X communication with uniform radiation element, plus embedding 4 units of 5G antennas. Customisable options as DSRC, C-V2X, UWB, AM/FM, WIFI dual-frequency.



HX-AULT006

HX-AULT006 offers comprehensive GNSS support and exhibits stable phase centre variation, extraordinary 4.5dBic (typical value) gain with ultralow signal loss, wide beam width and low elevation satellite tracking ability.



HX-AULT008

HX-AULT008 offers comprehensive GNSS support and exhibits stable phase center variation, extraordinary 4.5dBic (typical value) gain with ultralow signal loss, wide beam width and low elevation satellite tracking ability.



HX-AULT002

HX-AUST002 seamlessly integrates multi-constellation multi-band GNSS antenna, consistent V2X communication with uniform radiation element, plus embedding 4 units of 5G antennas. Customisable options as DSRC, C-V2X, UWB, AM/FM, WIFI dual-frequency.

COMPACT HELICAL GNSS ANTENNAS



HX-CUX005A

Embedded Helix GNSS with integrated WiFi & BT



HX-CU7603A

High performance GNSS with L-Band reception



HX-CH7609A

High Stability GNSS with strong interference rejection



HX-CHX600A

Rugged precision GNSS with L-Band reception



HX-CH7603A

High gain on low elevation satellites provides exceptional signal.



HX-CH6601A

Small and light GNSS with high stability



HX-CHX602A

High gain foldable Helix GNSS

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