

Testing GNSS Real Time Kinematics (RTK) modules

CONNECTED AUTONOMOUS VEHICLES

DRONES

PRECISION AGRICULTURE

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RTK is a differential technique used to enhance the precision of positioning data derived from satellite-based positioning systems (GNSS) that can provide accuracy down to centimetre-level. Removing much of the error introduced by atmospheric conditions opens up new opportunities for the use of GNSS in a range of applications.

Multi-GNSS RTK receivers are increasingly being used in areas such as autonomous vehicles, commercial drones, and precision agriculture, where a high-accuracy solution is critical. However, as with other positioning techniques and solutions, accuracy and stability are not necessarily assured.

To improve the performance of their products and validate the confidence that the localisation solution is correct, developers and integrators need a comprehensive and forward-thinking test solution – and at an affordable price point.

Connected Autonomous Vehicles

Decimetre to centimetre level precision is required to improve vehicle Advanced Driver Assistance Systems (ADAS) to eventually reach full automation (SAE Level 5).

Autonomous vehicles use RTK/GNSS positioning in combination with other sensors to ensure vehicles stay in lane, maintain safe distances, and much more.



Precision Agriculture Robots

Fully autonomous robots could help farmers produce more food, more sustainably, and at a lower cost.

Agricultural robots are designed to plough, plant, spray, prune, milk, pick, shear, and harvest. They excel at repetitive or dangerous tasks, letting farmers tend to more strategic matters.

GNSS/RTK is often a key technological component underpinning these robots.



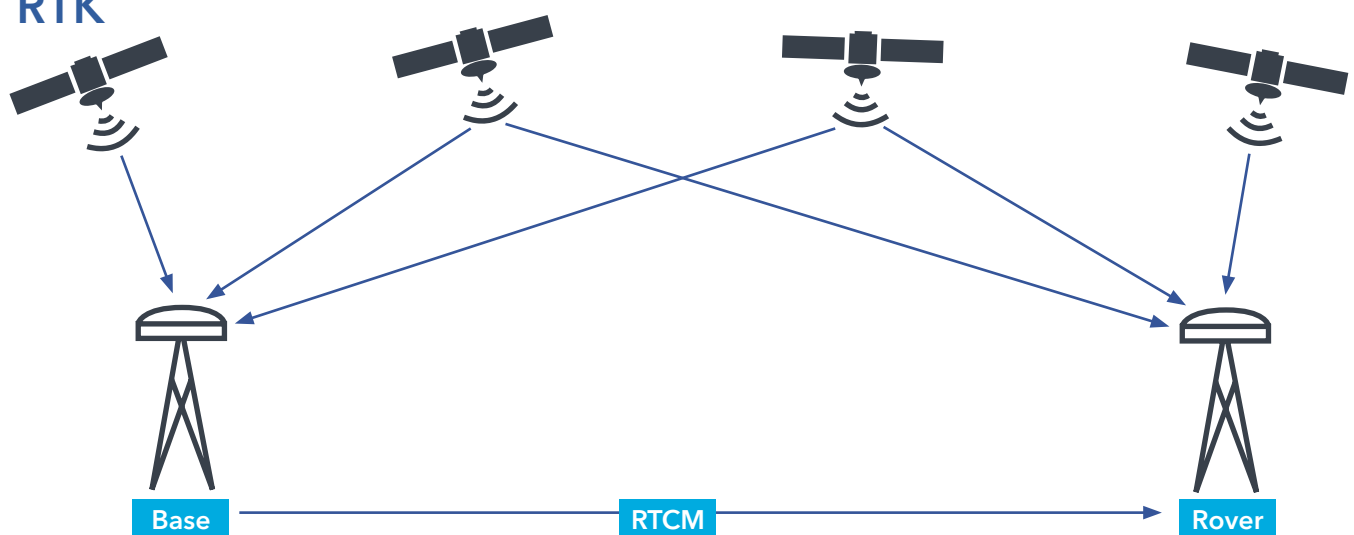
Commercial Drones

Commercial drones can be used for surveying and mapping, construction, and precision agriculture.

The benefits of the pinpoint accuracy of UAVs using RTK are numerous: operability in small spaces and close to objects, steady hovering and movement enabling pilots to meticulously gather geotagged data, and even protection from radio frequency interference (RFI).

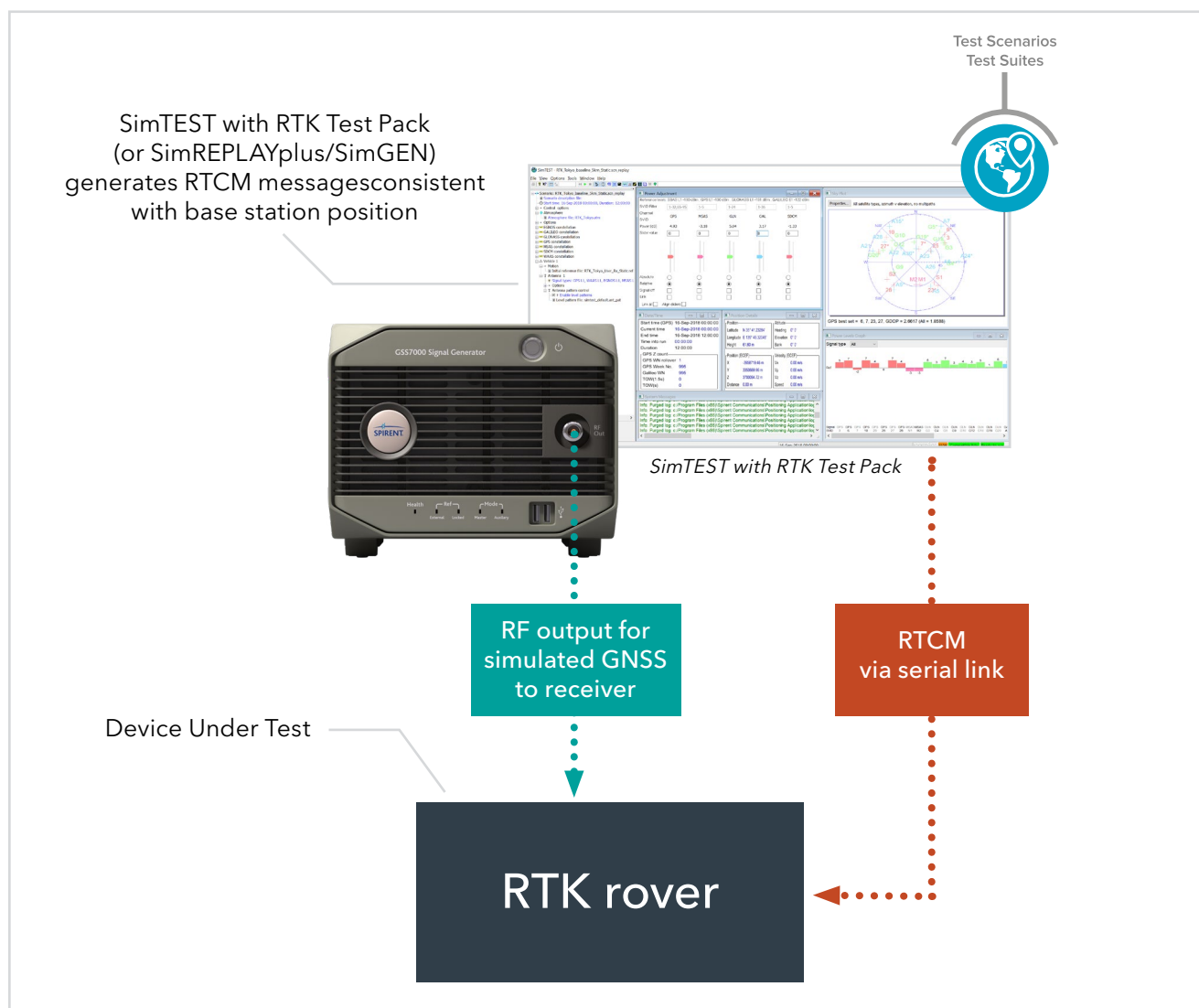


RTK



How can Spirent help?

The only way to thoroughly validate and evaluate the performance and resilience of your multi-GNSS RTK receiver is via scientific testing. Simulation provides the control and repeatability needed to test and optimise the various RTK configurations.



GNSS Simulation: GSS7000

The Spirent GSS7000 is a powerful and versatile multi-GNSS, multi-frequency constellation simulator for all test use cases and budgets. Available with three different levels of software – SimGEN® / SimREPLAYplus™ / SimTEST – and fully customisable according to your needs. Features include:

- Simulate up to 256 satellites simultaneously
- RTK message simulation: generate RTCM corrections with SimGEN/ SimREPLAYplus, or with SimTEST and the RTK Test Pack
- Multipath simulation



GPS L1 C/A	GLONASS L1 C/A	GALILEO E5 a/b	BeiDou-3 B1C	QZSS L1	QZSS L6
GPS L2 C/A	GLONASS L2 C/A	BeiDou-2 B1I	BeiDou-3 B2A	QZSS L2	IRNSS L5
GPS L5 I/Q	GALILEO E1 OS	BeiDou-2 B2I	BeiDou-3 B3I	QZSS L5	SBAS

RTK Scenario Pack

The right test equipment provides all the means to evaluate and improve your RTK solution. However, without the right tests being run it will not achieve anything. A predefined set of scenarios built by experts takes much of the time, worry, and even cost out of testing. Spirent's RTK Scenario Pack provides the test cases needed to test the performance of your DUT and help you ascertain the benefit of RTK over a standalone positioning mode. The pack will contain scenarios for the different parameters illustrated here:

Common parameters for the scenarios

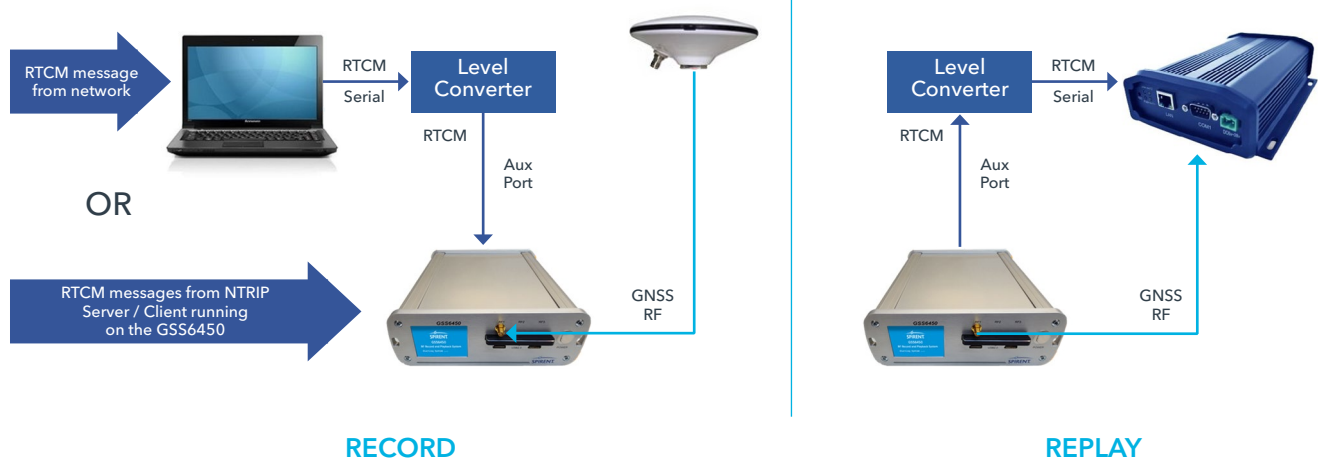
CONSTELLATIONS	FREQUENCY BANDS	RTCM VERSION	DURATION
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Individual parameters for each RTK scenario

LOCATIONS	BASELINES	MOTION (STATIC or CIRCULAR)
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Record & Playback: GSS6450

RTK is a growing technology in a variety of applications. The GSS6450 can provide the high quality carrier phase observations required for RTK carrier phase post-processing purposes.



About Spirent Communications Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks. We help bring clarity to increasingly complex technological and business challenges. Spirent's customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled. For more information, visit: www.spirent.com



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