CASE STUDY

# Spirent builds custom solution for RTK service launch

Spirent Federal Systems

# Spirent builds custom solution for RTK service launch

## The Customer

Our customer is a leading global telecommunications provider, delivering products including voice, data, and video services and solutions on its leading 4G LTE and 5G networks and platforms.

Our customer was launching a Real Time Kinematic (RTK) service in the USA to facilitate highly accurate positioning in the automotive industry for self-driving cars.

As a newcomer to the RTK service market, the customer had clear objectives:

1. Find out how well their RTK service performs through independent testing against specification and standards.
2. Benchmark their RTK service performance against three incumbents in the RTK service space.

The customer chose to engage our services team for two key reasons: firstly, the variety of tests they needed to carry out would have required a significant investment in test equipment; secondly, the nature of the tests and the combination of parameters involved necessitated a high level of expertise.

Real Time Kinematic (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. This technology allows for much higher accuracy and lower positional errors by removing much of the error introduced by atmospheric conditions.

Spirent Federal Systems

## Challenge

The self-driving cars of the future will always need to know where precisely they are on the road. Developers of advanced driver-assistance systems (ADAS) and fully autonomous control systems are exploring different ways of obtaining reliable sub-centimetre positioning accuracy. Standalone GNSS is not yet capable of providing the continuous, reliable, centimetre-level accuracy that technologies such as autonomous vehicles, commercial drones and precision agriculture robots need. However, in these demanding use-cases, multi-GNSS RTK receivers are quickly being adopted. For instance, autonomous vehicles use RTK in combination with other sensors to ensure they can stay in lane, maintain safe distances, and much more.

## How can Spirent help?

The only way to thoroughly validate and evaluate the performance and resilience of RTK service is via scientific testing.

Spirent conducted an RTK service assessment in California, USA by conducting a 1000-mile circular test route from San Francisco to Los Angeles, and a series of eight static performance tests in different locations for overall positioning accuracy. California was chosen for the test location because its complex environment of buildings and landscape allowed the opportunity for comprehensive testing.

The niche expertise of Spirent Professional Services meant that the customer had no doubt that the quality of the data and findings would be of the highest standard. Spirent was able to provide all equipment for the test set-up and take care of logistics, saving the customer time and money. Spirent was also able to overcome the barrier faced by the customer of subscribing to the competitor services.

### Set up

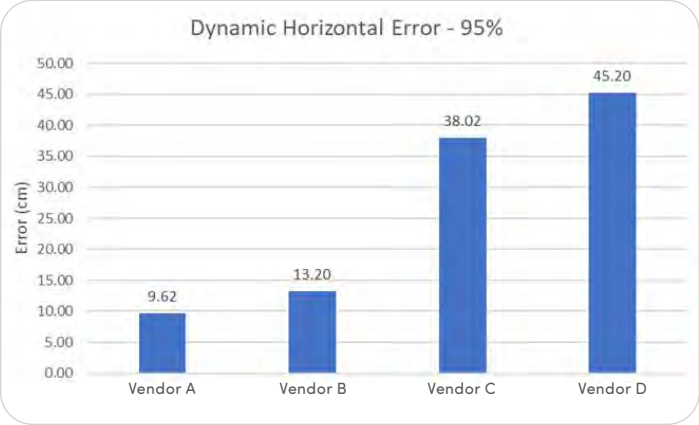
Four identical automotive grade receivers and a truth survey grade receiver were connected to a common radio frequency (RF) antenna with identical RF paths. Spirent was able to capture field data simultaneously from all vendors and accompanying reference truth data with this custom test set-up.

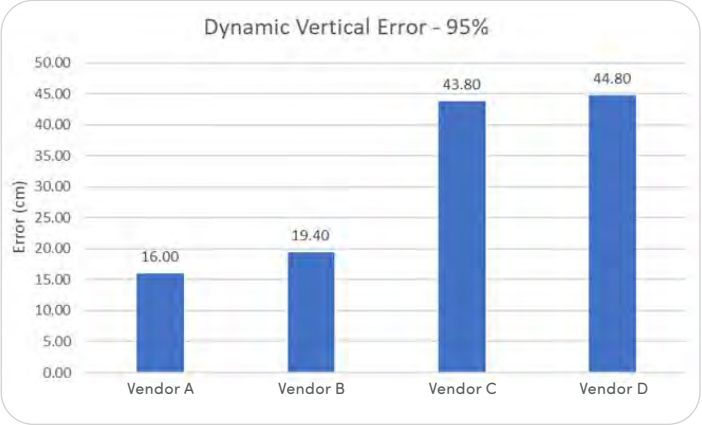
### Findings

RTK availability was consistent across the services at approximately 93% for all test data. The common 7% outages were due to drops in 4G signal availability and receiver cold starts.

Vendor A and Vendor B receivers spent 94-95% of the test route in Fixed state, whereas Vendors C and D were measured at 83% and 55% respectively.

The Vendor D receiver typically had longer convergence times, which had a detrimental effect when compared with its competitors after momentarily losing Fixed state during signal obscurations.



## The Results

An independent and unbiased set of results with detailed findings and recommendations was provided. This included:

- A heatmap showing how our customer's RTK service ranked against its competitors in specific conditions
- All the recorded data and logs from the project
- A thorough report with actionable recommendations

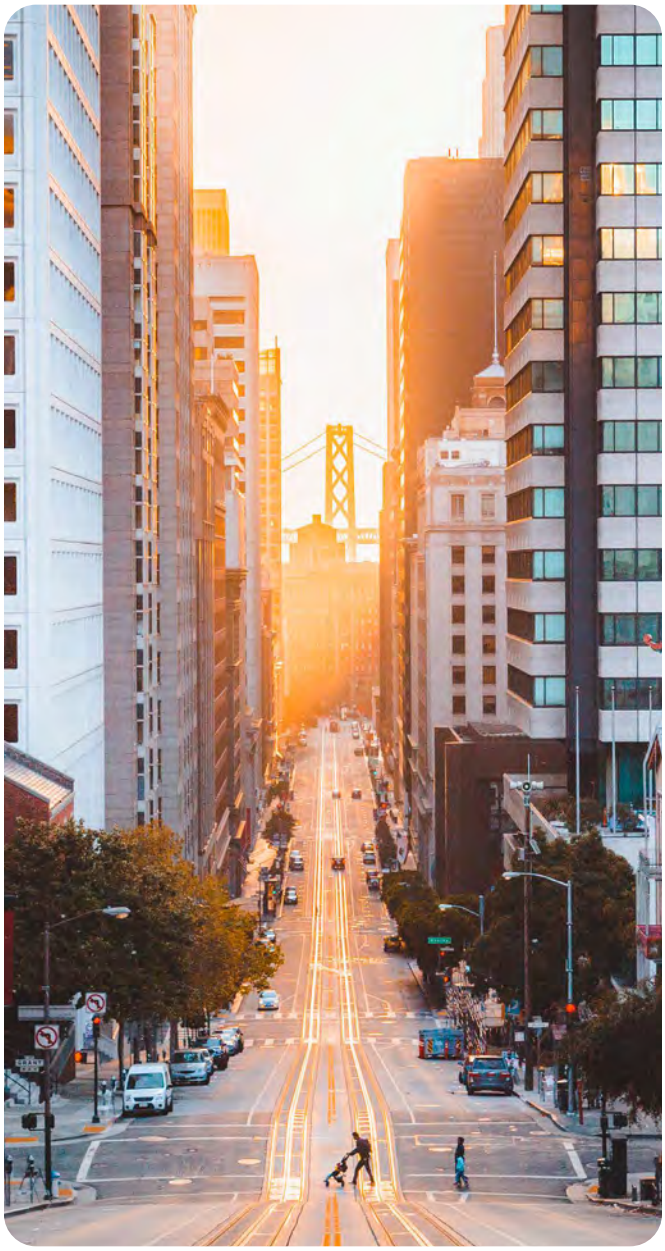
By characterizing the availability and performance of the RTK services along a 1000-mile test route, our customer has been able to ensure their service meets the strict target performance criteria needed for a successful launch and an enduring RTK service.

Deeper analysis can subsequently be performed on their field data to conduct further improvements. The quantity of data collected allows a detailed reconstruction of events, from investigating why accuracy dropped in certain locations or conditions, to assessing accuracy, timing, availability, and usage potential of the correction data.

The high level of expertise and high-quality test data delivered were invaluable for the launch of the customer's RTK service.

## Where will they go from here?

Our customer may commission Spirent to conduct additional testing in other key regions such as suburban and dense urban to enhance the quality of the RTK service.



Spirent's services team brings decades of experience to your operations, helping you to accelerate and de-risk product development and verification. Whether you need recordings or scenarios delivered to order, resident engineering support, consultancy, analysis, benchmarking, or any other support inside and outside the lab, Spirent services is the ideal partner.

# Americas Europe Asia

## About Spirent Positioning Technology

Spirent enables innovation and development in the GNSS (global navigation satellite system) and additional PNT (positioning, navigation and timing) technologies that are increasingly influencing our lives.

Our clients promise superior performance to their customers. By providing comprehensive and tailored test and assurance solutions, Spirent assures that our clients fulfill that promise.

## Why Spirent?

Across five decades Spirent has brought unrivaled power, control and precision to positioning, navigation and timing technology. Spirent is trusted by the leading developers across all segments to consult and deliver on innovative solutions, using the highest quality dedicated hardware and the most flexible and intuitive software on the market.

Spirent delivers

- Ground-breaking features proven to perform
- Flexible and customizable SDR technology for future-proofed test capabilities
- World-leading innovation, redefining industry expectations
- First-to-market with new signals and ICDs
- Signals built from first principles — giving the reliable and precise truth data you need
- Unrivaled investment in customer-focused R&D
- A global customer support network with established experts

ilac-MRA ACCREDITED

INVESTORS IN PEOPLE | Platinum Until 2022

**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**


**US Go/Defense**
801-785-1448 | info@spirentfederal.com

**Europe and the Middle East**
+44 (0) 1293 767979 | emeainfo@spirent.com

**Asia and the Pacific**
+86-10-8518-2539 | salesasia@spirent.com





**MCD00473 Issue 1-00 | 10/22**


spirent Federal Systems