



SKYLARK™

Precise Positioning Service

Skylark™ PRODUCT SUMMARY

Precise Positioning

Swift Navigation's Skylark is a wide area, cloud-based GNSS corrections service that delivers real-time high-precision positioning to autonomous vehicles, automotive, mobile and mass-market applications. Skylark delivers seamless corrections to continents across the globe including the United States, Europe, South Korea, Japan, Taiwan and Australia. Built from the ground-up for autonomy at scale, Skylark enables lane-level positioning, fast convergence times and high integrity and availability required by mass-market automotive and autonomous applications.

HIGH-PRECISION CORRECTIONS

Skylark uses observations from hundreds of GNSS reference stations around the globe to generate a real-time model of atmospheric and other errors affecting GNSS signals. This correction data is delivered over the Internet to the user where it can be seamlessly accessed anywhere within the Skylark network. Connected users simply turn on their devices to get the correction stream they need.

ACCURACY, INTEGRITY AND FAST CONVERGENCE

Skylark is built from the ground up for the needs of emerging autonomous applications, with performance to match. Skylark's 4 cm accuracy* delivers the performance autonomous vehicles require, including ADAS, V2X and autonomous driving use cases that require lane-level positioning. Skylark reduces initialization times to seconds, ensuring high-accuracy and high-integrity positioning is available when you need it. Skylark is designed for the most demanding safety-of-life critical applications. When used with Swift's [Starling®](#) positioning engine, Skylark is capable of delivering Protection Levels (PL) down to 1 m and Target Integrity Risk (TIR) down to 10⁻⁷ / hour or better. Skylark supports automotive functional safety standard ISO 26262 (ASIL B).

MASS-MARKET SCALABILITY

Skylark is built for mass-market deployment, enabling high-accuracy positioning at a continent-wide level. In contrast to traditional Network RTK (N-RTK) services, Skylark's patented cloud-based, wide-area modelling solution provides identical performance throughout the coverage area, overcoming an industry recognized problem where performance decreases as you move away from the nearest reference station. Skylark's unique architecture provides best-in-class reliability and availability and is resilient to individual reference station outages—a feature which cannot be achieved in a N-RTK based solution.

BENEFITS

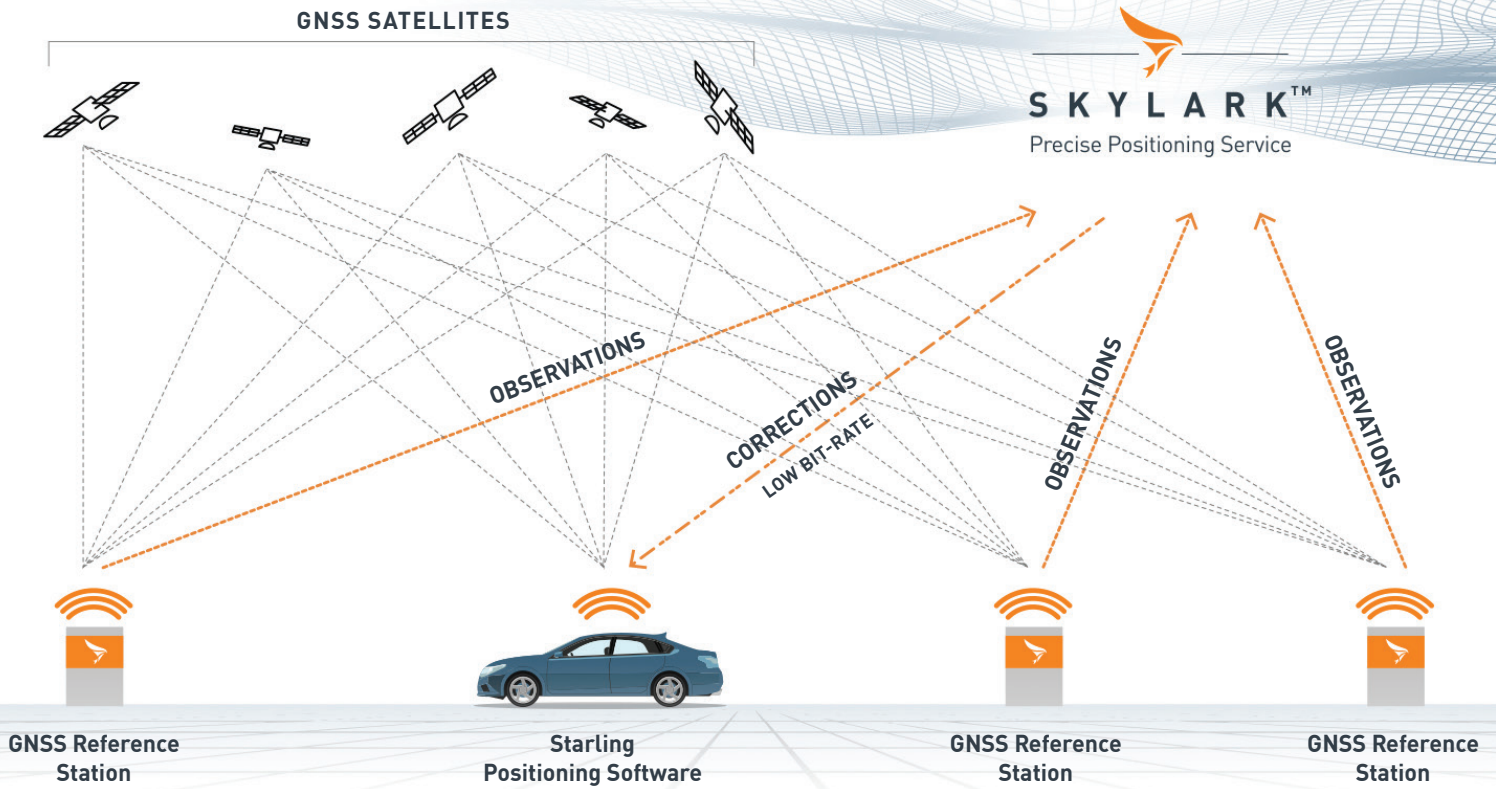
- Designed for Autonomy
- Lane-Level Positioning with Fast Initialization
- High Integrity Option Available for Safety-of-Life Critical Applications
- Scalable to Millions of Connected Vehicles and Devices
- Best-in-Class Reliability and Availability
- Highly Secure
- Direct and Enterprise Cloud Integration Options

FEATURES

- 4 cm Accuracy*
- 5 s Convergence to 25 cm Accuracy**
- Ever-Expanding Geographic Coverage
- Integrity with PLs Down to 1 m and TIR Down to 10⁻⁷ / Hour or Better
- Supports OSR and SSR Corrections Formats
- Provides Corrections for GPS L1/L2/L5, GAL E1/E5b/E5a and BeiDou B1/B2a
- RTCM v3.1 and v3.2 MSM over NTRIP 2 Supported for Compatibility
- Mapping Datum ITRF2014

*4 cm 50% accuracy measured over 24 hours stationary. Actual system performance may vary, dependent but not limited to; environmental, receiver and antenna characteristics, location of operation.

**When using Starling positioning engine.



LEVERAGES LEADING-EDGE TECHNOLOGY

Skylark is hardware-independent, giving customers choice in today's rapidly improving and commodifying GNSS sensor ecosystem. OEMs are able to benefit from the lane-level positioning Skylark delivers using a host of third-party receivers and microprocessors in addition to working seamlessly with Swift's Starling software positioning engine and Swift's hardware product line including Piksi® Multi, Duro®, Duro Inertial, SwiftPath, Precision GNSS Module (PGM) and PGM Evaluation Kit. Skylark also supports third-party receivers using industry standards (RTCM and NTRIP).

CORRECTIONS AS A SERVICE

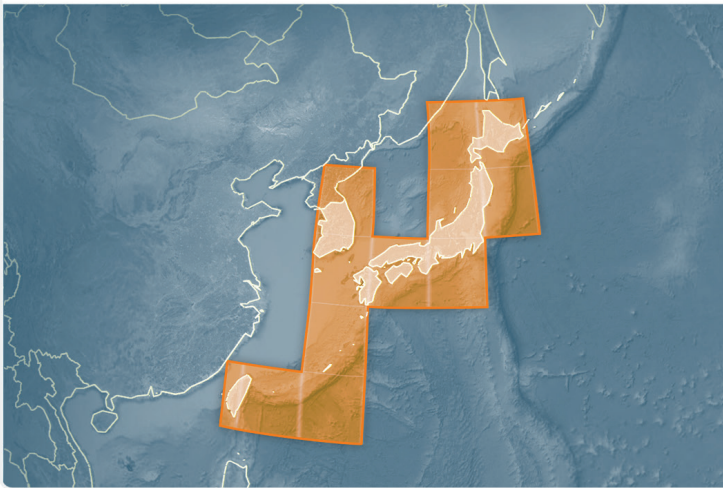
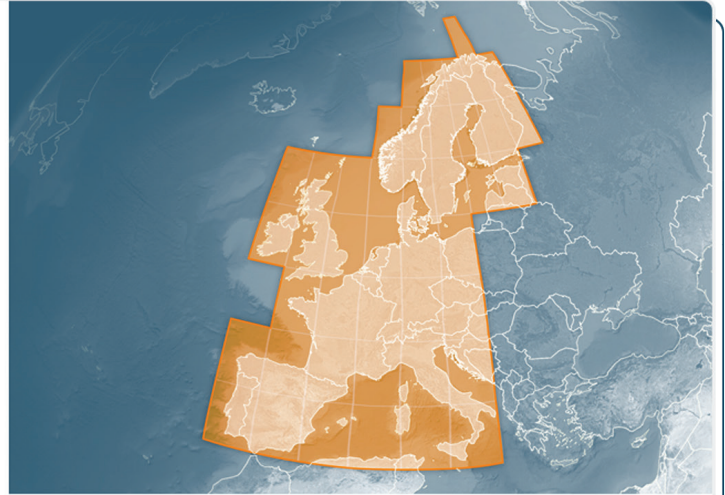
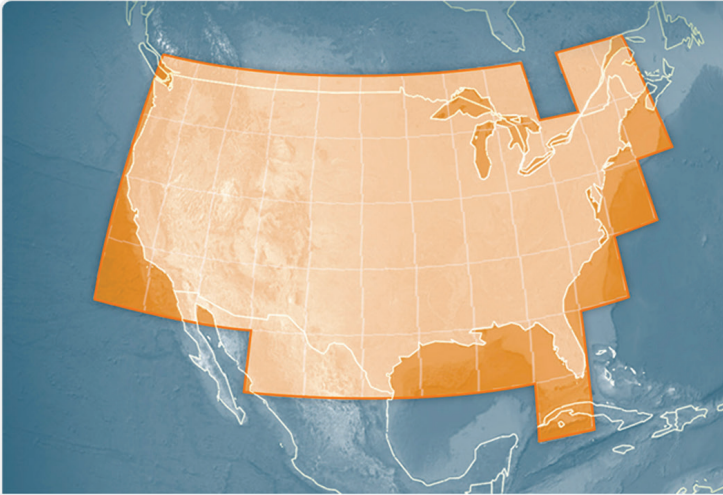
Skylark provides a simple path for customers to achieve lane-level accuracy over a wide area. By moving the service to the cloud, Skylark creates a platform for accurate positioning for a wide variety of applications and industries.



SKYLARK

Precise Positioning Service

Skylark delivers seamless corrections to continents across the globe—currently available in: the United States, Europe, South Korea, Japan, Taiwan and Australia.



SKYLARK FEATURES	
Simple and Easy to Use	✓
Fast Time-to-Market	✓
Corrections Distribution	Directly Through Skylark or Indirectly Through Customer Backend ¹
Supported GNSS Signals	GPS L1CA, L2C, L5 Galileo E1, E5b, E5a Beidou B1i, B2a
Supported Swift Clients	Starling Positioning Engine Piksi Multi GNSS Receiver Duro GNSS Receiver Duro Inertial GNSS Receiver PGM Evaluation Kit
Supported 3rd-Party Clients	3rd Party RTK Receivers via NTRIP / RTCM
Accuracy	4 cm ²
Corrections Availability	99.9% Minimum
Integrity	Protection Level of 1m and TIR of 10 ⁻⁷ Failures / Hour ³
Convergence Times to Sub-Meter Accuracy	5s to 25cm Accuracy ³
Interface	NTRIP 1.0 / 2.0
Data Formats	RTCM 3.1 & 3.2 (OSR) SSR ⁴

¹ For enterprise customers wanting to distribute Skylark corrections through their backend, Swift offers Skylark Gateway. Contact Sales at sales@swiftnav.com to learn more.

² Actual system performance may vary, dependent but not limited to: use-case dynamics, receiver and antenna characteristics, location of operation. 4 cm 50% accuracy measured over 24 hours stationary.

³ When used with Starling Positioning Engine

⁴ Third-party client support is coming soon for SSR