Starling®
PRODUCT SUMMARY

STARLING®
Positioning Engine

Positioning Engine

Starling is an advanced GNSS positioning engine designed for automotive and IoT autonomy applications and is market proven through its use in Swift Navigation's precision GNSS receivers. Starling's software enhances the measurements for commercially available GNSS receivers to provide true precision and integrity capabilities to a variety of automotive-grade and consumer-grade GNSS chips.

ABSOLUTE POSITION, VELOCITY AND TIME
Starling features multi-band, multi-constellation support to provide centimeter-level accuracy. It supports the calculation of precise position, velocity and time (PVT) together with integrity. When combined with inertial sensor measurements, wheel odometry and other sensor inputs, the Starling Positioning Engine can assist with vehicle localization, decision and control.

DESIGNED FOR PORTABILITY
Starling has been designed for fast portability to leading automotive processors and operating systems. Customer engineering investment in porting and bring-up time are minimized through the use of industry standard protocols and application program interfaces (APIs).

PLATFORM INDEPENDENT
In addition to providing precision positioning in Swift's real-time kinematic (RTK) GNSS receivers, Starling enhances the measurements for commercially-available GNSS receivers to provide true precision and integrity capabilities. Starling is capable of ingesting raw GNSS observations from any measurement engine (ME).

GNSS RECEIVER AGNOSTIC
Starling works with multi-frequency, multi-constellation automotive and commercial-grade GNSS measurement engines, including the TeseoAPP and TeseoV automotive-grade GNSS chips. When combined with the wide-area Skylark™ cloud-based GNSS corrections service, Starling significantly reduces the cost of high-accuracy positioning for autonomous applications.

ENGINEERED FOR AUTOMOTIVE SAFETY APPLICATIONS
Starling has been engineered from the ground up to comply with the automotive industry functional-safety standard—ISO 26262 for Automotive Safety Integrity Level (ASIL)-B safety standards.

CONSTELLATION CONFIGURABLE
Starling is capable of running in real time and in post processing, allowing customers the flexibility to configure Starling to suit their system level requirements from the number of constellations tracked to the output rate desired. Starling supports the following: GPS L1/L2/L5, GLONASS G1/G2, BeiDou B1/B2, Galileo E1/E5b/E5a and SBAS.

BENEFITS

- **GNSS Receiver Agnostic**
- **Supports Third-Party GNSS Measurement Engines**
- **Built for Integrity**
- **ASIL Ready**
- **Centimeter-Level Performance**

FEATURES

- **Real-Time Processing Engine**
- **Highly Portable & Flexible Architecture**
- **Configurable to Suit Customer Processing Requirements**
- **Works with Multi-Constellation, Multi-Frequency GNSS Receivers**
- **Supports GPS L1/L2/L5, GLONASS G1/G2, BeiDou B1/B2, Galileo E1/E5b/E5a & SBAS**
- **Navigation Outputs: Swift Binary Protocol (SBP) & NMEA 0183**
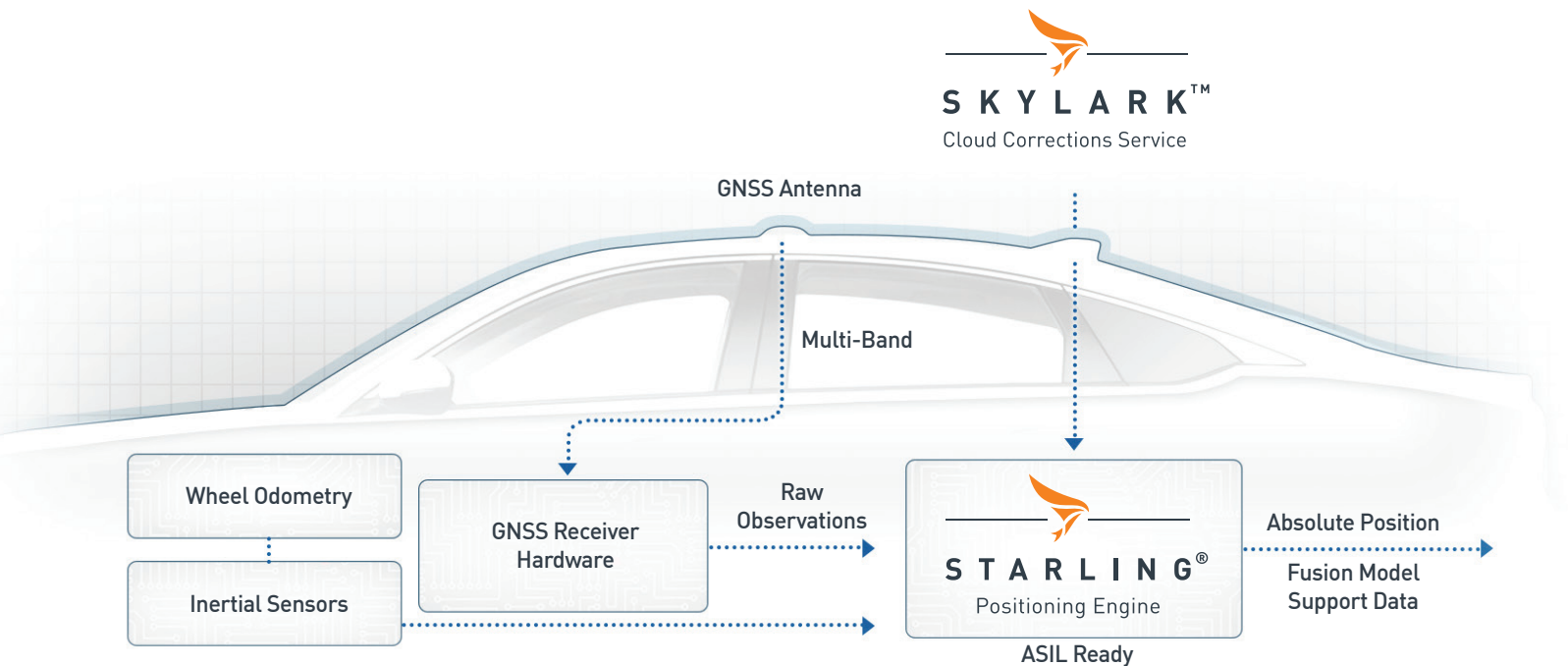- **Reference Inputs / Outputs: RTCM 3.1, 3.2**

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Precise Positioning Requirements for Automotive Safety Applications

Emerging automotive applications require improved position accuracies and integrity that cannot be met with the navigation positioning systems historically available.

Swift is engineering precise positioning solutions to deliver the accuracy and reliability required for tomorrow's automobiles. This includes combining the Starling Positioning Engine with automotive-grade GNSS chips and utilizing Skylark to stream corrections from the cloud to deliver accurate positioning.

With this comprehensive approach, Swift successfully delivers the precise positioning required at fleet-friendly prices.

SKYLARK™
Cloud Corrections Service

GNSS Antenna

Multi-Band

Wheel Odometry

Inertial Sensors

GNSS Receiver Hardware

Raw Observations

STARLING®
Positioning Engine

ASIL Ready

Absolute Position

Fusion Model Support Data

www.swiftnav.com | @SwiftNav | sales@swiftnav.com