Device-Based 14-day GNSS Extended Ephemeris Solution

Accelerates satellite acquisition and boosts sensitivity of any GPS/GLONASS equipped device.

GPSTream PGPS™ predicted gps

Overview

GPStream™ PGPS is an Assisted-GNSS solution designed to substantially enhance the satellite acquisition performance of virtually any GNSS positioning engine, whether a chipset or next-generation software-GNSS. In practical terms, this means a reduction of Time-To-First-Fix from 45 seconds to 2 seconds or less. Moreover, fixes can be achieved in difficult environments where they were previously impossible.

PGPS works on any mainstream mobile operating system as well as proprietary embedded platforms, and can seamlessly adjust its performance if the device has full, occasional, or no network access at all. PGPS consists of a lightweight and patented software client that enables the device to generate its own GNSS assistance data, i.e. extended ephemeris. Extended ephemeris is a close approximation of the real broadcast ephemeris constantly transmitted by the satellites, which must normally be received by the device before it can start calculating its position.

PGPS preloads extended ephemeris data into the GNSS chipset, thereby avoiding the latency and higher bandwidth usage inherent in real-time Assisted-GNSS approaches. The net result is super fast satellite acquisition and improved GNSS sensitivity. In other words, a better user experience when consuming Location-Based Services.

14 Day Predictions

GPStream™ PGPS 7 builds on PGPS 6 by increasing the prediction period from seven to 14 days (from three to five days for Autonomous Mode).

Dual Mode

In Connected Mode, PGPS receives small files (4.5 kB per constellation) every two weeks to enable full constellation predictions of the satellite orbits. This advantageously compares with other chipset-proprietary extended ephemeris solutions that require ~150 kB transfers for each satellite constellation. The PGPS client uses these seeds to locally generate 14 days of satellite orbit and clock predictions.

Only Device-Based Solution Designed for Connected & Autonomous Devices

If a network connection is not available, PGPS invokes the Autonomous Mode functionality of a previously stand-alone product – GPStream SAGPS™, predicting the orbits of observed satellites for the next five days. Autonomous Mode works with as little as one broadcast ephemeris (BCE) observation but continues to develop and refine the prediction every time a new BCE is obtained.

PGPS can intelligently switch between modes, maintaining a consistent user experience as the device moves in and out of connectivity, without requiring a real-time AGNSS connection. This is particularly helpful in roaming scenarios or in markets where data plans are not affordable. Alternatively, PGPS can be configured to operate solely in either mode.
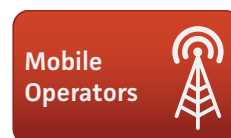
Dual Constellation

PGPS supports both GPS and GLONASS constellations. Additional constellations will be supported as they become commercially available.
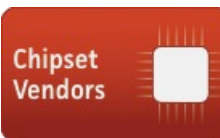
Chipset Vendors
- "Must-have" competitive feature
- Can be resold or licensed by OEM directly
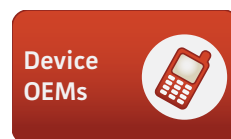
Device OEMs
- Reduced design-in times
- Multi-GNSS chipset support
- Consistent user-experience

Mobile Operators
- Offload AGPS service infrastructure
- Data overhead reduced by up to 95%
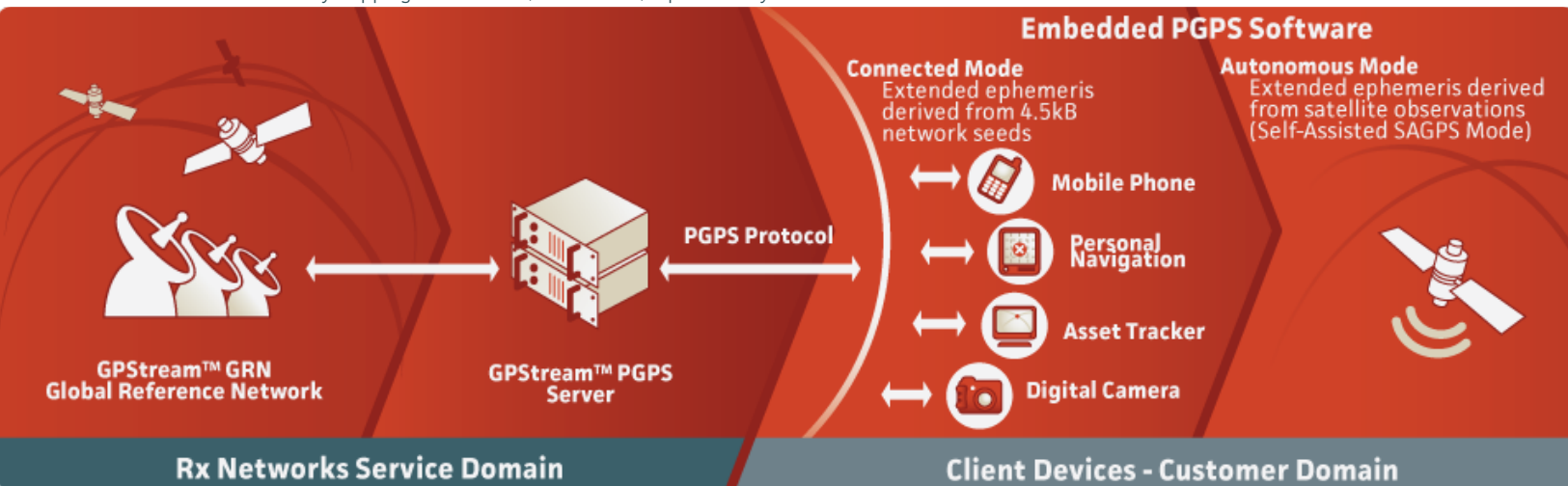- Consistent, global performance

Benefits

- Improved user experience
- Fast fix regardless of state of connectivity
- Lower battery consumption
- Highly bandwidth efficient
- Patent protection
- Platform independent
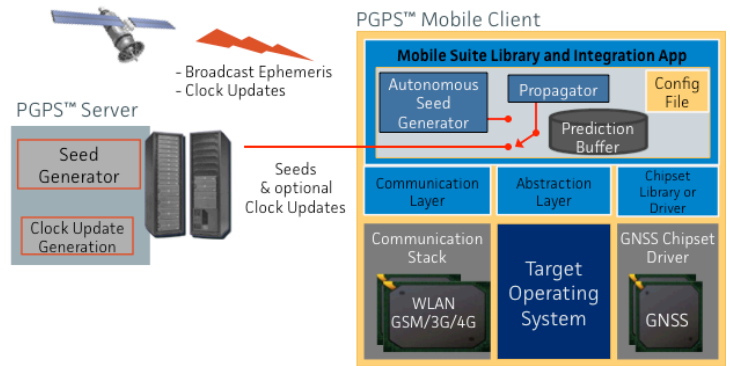
System Performance Benchmarks*	Connected Mode	Autonomous Mode
Warm TTFF (GNSS Chipset Dependent)	1 to 10 seconds	1 to 10 seconds
Cold TTFF (GNSS Chipset Dependent)	2 to 15 seconds	2 to 15 seconds
Accuracy Performance 68th Percentile URE	Day 7: GPS: 18m GLO:18m Day 14: GPS: 40m GLO: 40m	Day 1 GPS: 8m GLO: 8m Day 3 GPS: 18m GLO: 18m Day 5 GPS: 33m GLO: 33m (2 BCE observations)
Network Overhead	4.5kB/week/constellation	None
Platform Support	Windows XP, Windows Mobile, Android, Linux, Embedded ARM, contact Sales for others	
GNSS Chipset Support	Multiple chipsets from several vendors including Texas Instruments, ST Microelectronics, ST Ericsson	
Program Store (OS / CPU Dependent)	~250 kB	
Prediction Buffer	Variable. As low as 46kB.	
Run-Time (Background Task) (1GHz Android 2.1 Platform)	10 sec for 14 days of prediction (full constellation)	40 sec for 5 days of prediction (10SVs) (2 BCE observations)
GNSS Constellation Support	GPS, GLONASS	

* PGPS Version 6.2 currently shipping. PGPS 7 data, shown here, is preliminary

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