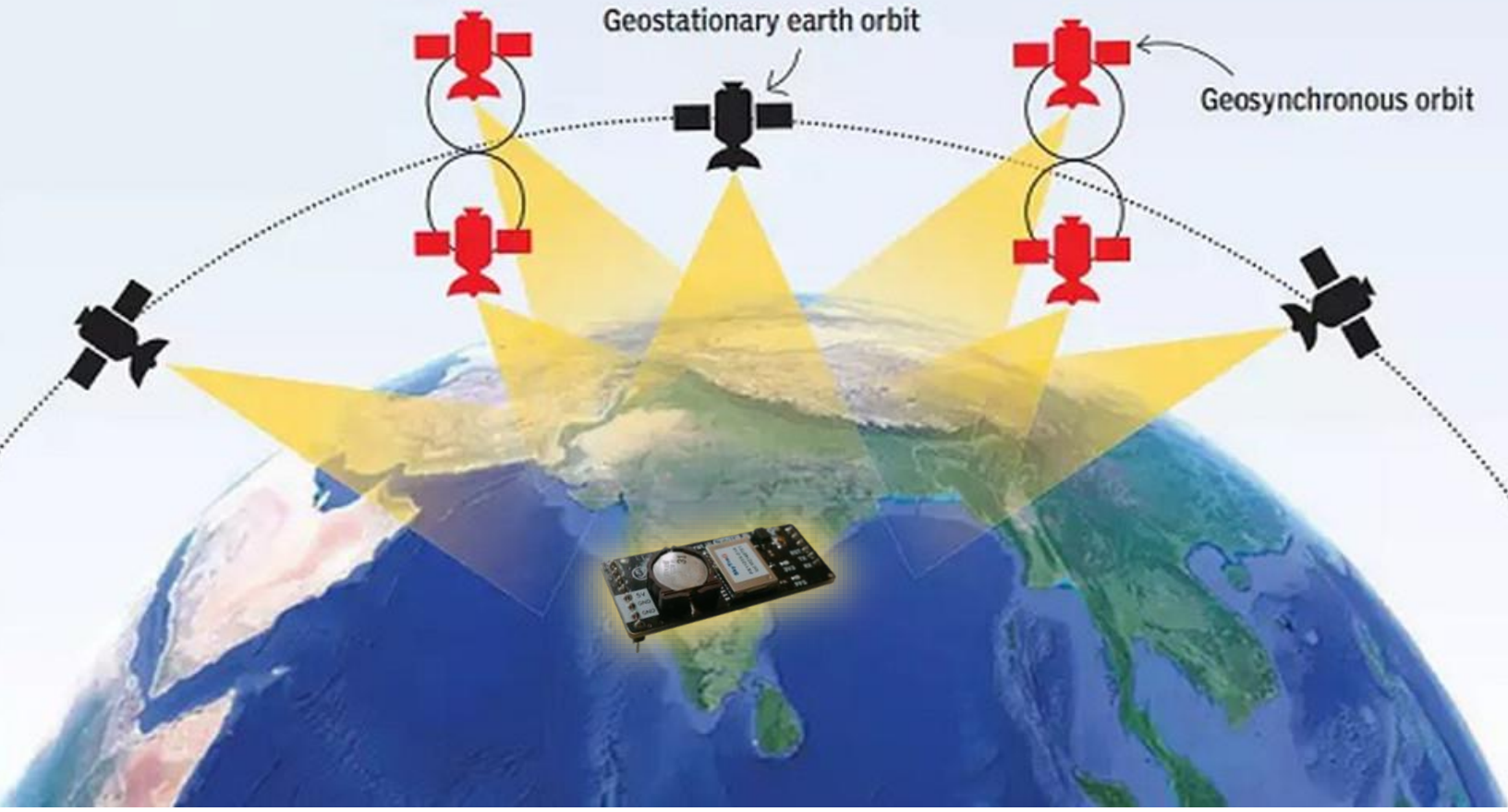
Bharat Pi – NavIC

NavIC Live Location Tracker Dev Module



Introduction

The Indian Regional Navigation Satellite System (IRNSS), with an operational name of NavIC (acronym for Navigation with Indian Constellation; also, nāvik 'sailor' or 'navigator' in Indian languages), is an autonomous regional satellite navigation system that provides accurate real-time positioning and timing services. It covers India and a region extending 1,500 km (930 mi) around it, with plans for further extension. The system currently consists of a constellation of eight satellites, with two additional satellites on ground as stand-by.

NavIC Module

Bharat Pi NavIC module is designed in a way to simplify development of live tracking/navigation devices and applications based on NavIC satellites. The module used is built for an India's AIS-140 market needs with 2m CEP accuracy.

The module is capable of using NavIC L5, GAGAN L1, and GPS L1 signal to provide 3D navigation in a single compact SMD module. It can track all in-view GPS, GAGAN and NavIC satellites. It is fully autonomous such that once power is applied, the receiver automatically searches, acquires, and tracks satellite signals. When enough satellites are tracked with valid measurements, the receiver produces 3D position and velocity outputs. NavIC + GPS dual-satellite capability enables using greater number of satellite signal than GPS-only receivers. The increased satellite number offers superior performance in challenging urban canyon and multipath environments. The module contains single-chip Phoenix positioning engine inside, featuring high sensitivity and fast TTFF (Time to First Fix). It can acquire, track, and get position fix autonomously in difficult weak signal environment. Its high tracking sensitivity allows continuous position coverage in nearly all outdoor application environments. The high-performance signal parameter search engine is capable of testing 16 million time-frequency hypotheses per second, offering superior signal acquisition and TTFF speed.

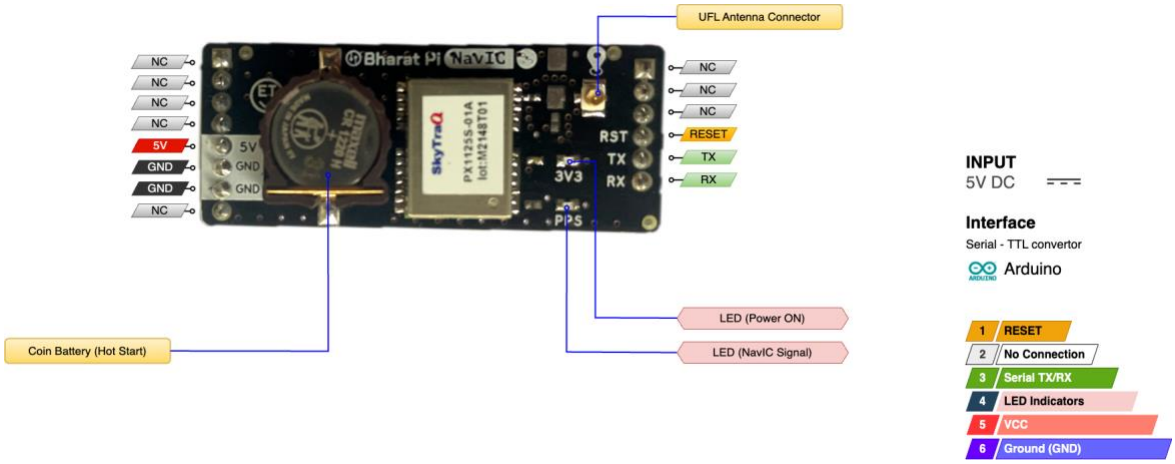
Key Features

- L1 / L5 signal reception
- Works with NavIC, GAGAN, GPS
- Less than 30 second cold start TTFF
- ~ 1 second hot start
- ~2.5m CEP accuracy
- Multipath detection and suppression
- Works with passive and active antenna
- Complete receiver in 12.2mm x 16.0mm size
- Operating temperature -40 ~ +85ºC
- Pb-free RoHS compliant

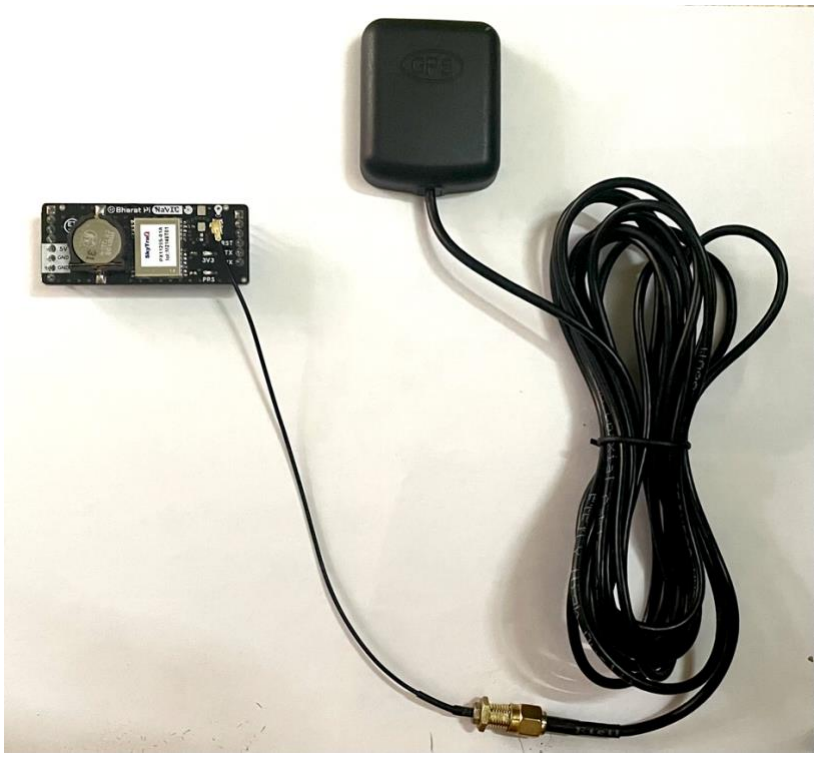
Technical Specifications

Receiver Type	NavIC L5, GAGAN/GPS L1 C/A code Phoenix engine
Accuracy	Position – 2.5m CEP Velocity – 0.1m/sec Time – 12nsec
Startup Time	~1sec hot start < 30sec cold start
Sensitivity	Better than -145 / -144dBm GPS / NavIC cold-start Better than -154 / -153dBm GPS / NavIC hot-start Better than -155 / -154dBm GPS / NavIC re-acquisition Better than -165 / -156dBm GPS / NavIC tracking
Multi-path Mitigation	Multi-path detection and suppression
A-GPS	7-day server-based AGPS Self-aided ephemeris estimation
Update Rate	1 / 2 / 4 / 5 / 8 / 10 Hz, default 1Hz
Dynamics	4G (39.2m/sec^2) acceleration
Operational Limits	Altitude < 80,000m and velocity < 515m/s, not exceeding both
Serial Interface	3.3V LVTTL level UART, selectable 4800 ~ 115200 baud rate
Protocol	NMEA-0183 V3.01, SkyTraq binary, 115200 baud, 8, N, 1
Datum	Default WGS-84, User definable
Input Voltage	3.3V DC +/-10%
Current Consumption	80mA acquisition, 60mA tracking
Dimension	12.2mm W x 16.0mm L x 2.9mm H
Operating Temperature	-40^{0}C ~ +85^{0}C
Storage Temperature	-55^{0}C ~ +100^{0}C
Humidity	5% ~ 95%

NavIC Pinout



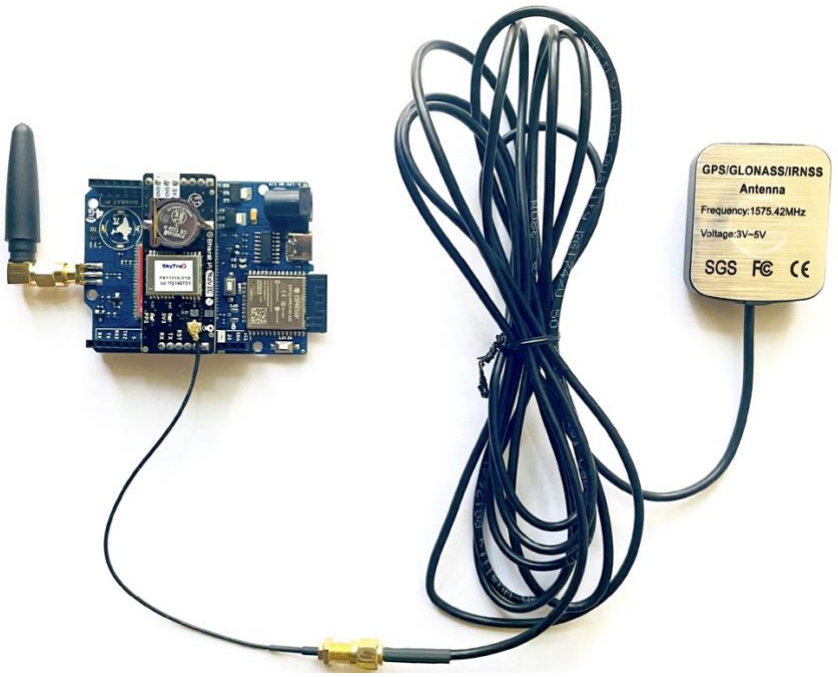
Bharat Pi NavIC Pinout Diagram



Bharat Pi NavIC Module Connected to L1/L5 IRNSS Antenna

NavIC Applications

Bharat Pi NavIC module can be easily mounted on Bharat Pi 4G boards for building live location tracking applications like GPS trackers, Asset monitoring etc. Bharat Pi 4G board comes with SD card for offline data caching. Any operator 4G/2G or even M2M sim card from Airtel, Jio, Vodaphone, BSNL can be used for cloud sync and live location tracking.



Bharat Pi NavIC Module Mounted on 4G module and connected to L1/L5 IRNSS Antenna

Used for Live tracking and navigation applications using any 4G/2G or M2M based Sim card.

Contact Us

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