



FoX NavRIX GNSS Receiver

FoX NavRIX, Beyond Gravity's cost-efficient, redundant, multi-constellation (GPS, Galileo), multi-frequency GNSS receiver for commercial LEO, MEO, GEO & cis-lunar missions provides an outstanding on-board real-time navigation performance with accuracy below 20 cm. It is specifically designed for use in harsh space environments also for mission durations > 10 years. Due to its SDR design the receiver provides the maximum amount of resilience, availability, and flexibility.

Key Features

- The NavRIX Pinpoint receivers rely on BG’s proven space [heritage](#) and are [designed for space environments and long lifetimes](#), providing the highest [fault tolerance and availability](#) in the radiation environment encountered in orbit.
- [Flexible Software Defined Radio design](#) with all BG heritage building blocks unified in a single product allows adaption to the needs and requirements of different constellations or future missions even after launch.
- [Outstanding position, velocity & timing performance](#) of under 20cm 3D rms, < 1 mm/s, and < 5 ns rms applying Precise Point Positioning (PPP) technique (option)
- [Highest availability in flight](#) due to active mitigation of radiation effects in the design reducing performance outages to the bare minimum.
- The advanced dynamically filtered navigation solution implemented [guarantees resilience](#) and allows also for outstanding positional and timing performance [even during periods of GNSS outage](#).

Supported Signals	Time-to-first fix	Performance
<ul style="list-style-type: none">• GPS L1 C/A• GPS L5 I/Q• GPS L2C• Galileo E1 B/C• Galileo E5a I/Q• Galileo E6	<ul style="list-style-type: none">• Warm start typ. < 60 s• Cold start typ. < 60 s	<ul style="list-style-type: none">• Position 3D rms < 0.2m (PPP)• Velocity 3D rms < 1 mm/s (PPP)• Time 1 sigma < 5 ns (PPP)

Data Products	Physical / environment
<ul style="list-style-type: none">• Navigation solution based on multi-frequency and dual-constellation (GPS/Galileo) measurements• Up to 2 independent PPS signals synchronized to GPS/Galileo• Carrier & Code phase measurements for each tracked signal• Support Data:<ul style="list-style-type: none">• Tracking state• GDOP• Carrier to noise (C/N0) measurement of each tracked signal• Noise measurements of each RF down conversion chain• Satellites in view status• Satellite navigation message	<ul style="list-style-type: none">• Full internal redundancy (“two receivers in a box”)• Size (incl. feet): 210x155x112 mm³ (8.3" x 6.1" x 4.4")• Weight: 3.6 kg (7.9 lbs); GEO version: 4.1 kg (9 lbs)• Operating temperature: -20° C to +60° C• Total Ionisation Dose (TID) allows >10 years in LEO• Power consumption: 10 W avg

Interfaces (per redundant half)	Program / heritage
<ul style="list-style-type: none">• 2 antenna inputs• TC/TM: UART (RS-422)• 2 PPS outputs (RS-422)• Primary power input 28 V unregulated (on/off command or autostart upon power application)• Up to 2 External clock inputs (opt)	<p>Beyond Gravity has delivered more than 100 flight models of GNSS receivers to customers in Europe, USA, Middle East and Asia.</p> <p>Some example missions:</p> <ul style="list-style-type: none">• SWARM (ESA)• Sentinel-1, Sentinel-2 and Sentinel-3 A/B (Copernicus)• Sentinel-1, Sentinel-2 and Sentinel-3 C/D• Sentinel-6/Michael Freilich A/B (NASA/ESA)• EarthCare (ESA/JAXA)• ICESat-2 (NASA)• PACE (NASA)• OSAM-1 (NASA)• Biomass (ESA)• FLEX (ESA)• KOMPSAT-6,-7 (KARI)• CAS-500 (KARI/KAI)• SWF-M (Ball Aerospace)

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