MULTI-CONSTELLATION GNSS MODULES

Easy-to-use and cost-effective embedded GNSS modules for addition of positioning, navigation, and timing capabilities to virtually any product

The PNT Series of Global Navigation Satellite System (GNSS) multi-constellation receivers are self-contained certified modules for positioning, navigation and tracking applications. The PNT-SG3FS and PNT-SG4FM are footprint-compatible flash-based modules for single frequency and multi-frequency GNSS deployments respectively.

The PNT-SG3FS standalone module integrates a Teseo III receiver from ST Microelectronics. The multi-constellation receiver can track up to 32 satellite signals in view across GPS L1C/A, BeiDou B1, Galileo E1B/C, GLONASS L1OF, SBAS L1C/A (WAAS, EGNOS, MSAS, GAGAN), and QZSS L1C/A bands. Systems can be designed to enable drop-in compatibility of the multi-frequency PNT-SG4FM that integrates a Teseo IV receiver and adds support for GPS & QZSS L5C, BeiDou B2a, and Galileo E5a bands. A custom firmware is available for Teseo IV based modules that can support IRNSS instead of GLONASS.

The PNT-SG3FS module supports Differential GPS (DGPS) data according to RTCM 10402.3 for improving location accuracy. The module can output measurement data (carrier phase) supporting PPP-RTK host algorithms for precise positioning applications with a custom firmware and supports 1.8V or 3.3V power supply domains. Assisted GNSS algorithms support extended ephemeris data using local autonomous or server-assisted based solutions for fast Time to First Fix (TTFF) operation. The PNT-SG4FM relies solely on server-assisted based Assisted GNSS.

Both modules embed flash memory that enables support for firmware updates, and, for the PNT-SG3FS, additionally enables data logging, geofencing, odometer, and 5 day autonomous assisted GNSS functionalities. The modules integrate a temperature compensated crystal oscillator (TXCO) for navigation performance and stability, and a real-time clock (RTC) oscillator with a clock-trimming feature to compensate for the accuracy of the 32.768 kHz crystal in timing applications. The PNT-SG4FM has a built-in LNA and SAW filter and adds short and open circuit detection functions for antenna status.

Markets:

Infrastructure

Smart Cities

Safety

Construction

Agriculture

Enterprise

Transportation

Consumer Solutions

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Constellation Support

Constellation	GPS/QZSS		Glonass	BeiDou (COMPASS)		Galileo		SBAS
SKU	L1 C/A	L5	L1OF	B1I	B2A	E1	E5A	L1 C/A
PNT-SG3FS-CT / PNT-SG3FS-TR	Y		Y	Y		Y		Y
PNT-SG4FM-CT / PNT-SG4FM-TR	Y	Y	Y	Y	Y	Y	Y	Y

Note: PNT-SG4FM custom firmware can support IRNSS instead of GLONASS.

Features

	Protocols	Accuracy			Interfaces	
SKU	NMEA	Carrier Phase Measurement Data	Meter	Sub-Meter	UART	I2C
PNT-SG3FS	Y	Y	Y	External PPP-RTK*	Y	S/F/HS slave
PNT-SG4FM	Y		Y	Y	Y	S/F slave

* Output measurement data (carrier phase) supporting PPP-RTK client algorithms requires a custom firmware.

Key Features

- Simultaneous tracking of multiple constellations
- Multi-frequency (PNT-SG4FM only)
- -163 dBm (PNT-SG3FS) / -162 dBm (PNT-SG4FM) tracking sensitivity
- 1.5 m CEP (PNT-SG3FS) / 0.7m (PNT-SG4FM) position accuracy
- Measurement data (carrier phase) (PNT-SG3FS only with dedicated custom firmware)
- 10 Hz receiver max fix rate
- Assisted GNSS
- Differential GPS (DGPS)
- Support timing applications
  - Accuracy of time pulse is +/- 12.4ns @ 99% measured using GPS + GLONASS
- Data logging, timing, geofencing, odometer functionality (PNT-SG3FS only)
- VCC/VBAT supply voltage when VCC_IO@1.8V: 1.8V or 3.3V
- VCC/VBAT supply voltage when VCC_IO@3.3V: 3.3V
- UART and slave I2C communication to host
- Tiny LCC 18-pin package (9.7 mm x 10.1 mm)
- Operating temperature: -40° - 85°C
- <=10 µA standby current and 65 mW tracking power consumption

Software

- The PNT Series is supported by ST Microelectronics' TESEO-SUITE PC software tool for managing, configuring and evaluating performance of Teseo GNSS family. ST's TESEO-SUITE is able to read, modify and save GNSS configurations. NMEA message-list is configurable per port for logging and analysis.

Certifications:

- The module certifications are scoped to include Radio Equipment Directive (RED) 2014/53/EU, EN 62368-1:2020/A11:2020, EN 62479:2010, ETSI EN 301 489-1 V2.2.0 + ETSI EN 301 489-19 V2.1.0, and ETSI EN 303 413 V1.1.1.

Applications:

- **Consumer Solutions** - Personal pet and individual locators, rugged navigation devices
- **Road Transportation and Automotive** - Fleet management, search & rescue, road traffic management, tolling, insurance telemetrics, rent-a-scooter/bike management
- **Drones** - UAVs
- **Maritime** - Traffic management, tracking, asset management, automation
- **Emergency Response** - Search and rescue, health monitoring, forensics
- **Rail** - Traffic management, tracking, asset management
- **Agriculture and Nature** - Precision farming, equipment automation, soil monitoring, forest management, virtual fencing, animal tracking, livestock trading
- **Geomatics and Scientific** - Surveying, tracking
- **Critical Infrastructures, Utilities, Telecomm** - Data and network synchronization, small cells, asset management, meter positioning and tracking, IoT remote monitoring, outage management, geo-planning, robotic automation
- **Military & Defense** - Asset and personnel tracking, synchronization, handhelds
- **Industrial and Industrial IoT** - Construction positioning, dock yards/shipping cargo tracking handhelds, forklift navigation, autonomous robotic vehicles, tunneling
- **Enterprise** - Construction equipment, asset management (for example, vending machines), time logs, security systems, fleet management, delivery services, autonomous robots

EVB Key Features

- Board powered through USB or battery for standalone usage
- ON/OFF and reset buttons
- Antenna SMA female connector
- PPS output with associated LED
- NMEA communication over UART (via USB cable) or I2C over signal connector

Ordering Information

Part Number	Description	
PNT-SG3FS-TR	Teseo III flash-based module	Tape and Reel (1000 units per reel)
PNT-SG3FS-CT	Teseo III flash-based module	Cut Tape in box (50 units per reel tape)
PNT-SG4FM-TR *Coming Soon*	Teseo IV flash-based module	Tape and Reel (800 units per reel)
PNT-SG4FM-CT *Coming Soon*	Teseo IV flash-based module	Cut Tape in box (50 units per reel tape)
PNT-SG3FS-EVAL	GNSS Eval Kit for PNT-SG3FS	
PNT-SG4FM-EVAL *Coming Soon*	GNSS Eval Kit for PNT-SG4FM	

Learn more at lantronix.com/pnt-gnss-series

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