Lassen LP GPS
Low power module for portable applications

Key Features and Benefits

- Programmable power management
- Sized for portable devices
- 3.3 V for battery powered applications

Trimble’s Lassen™ LP GPS is a low power miniature GPS receiver module that is ideal for power-conscious portable applications. It is intended specifically for system designers and integrators who are developing the next generation of portable devices. This embedded technology gives the system developer the programming flexibility to achieve a significant reduction in power consumption.

Power management
The Lassen LP GPS features a new set of power management tools that puts the power budget decision in the developer’s hands. The developer now can determine the best balance between operational frequency and power conservation for a particular application.

In Schedule Track™ operating mode, the developer can program the unit to power up, quickly acquire satellites and output position to a schedule. After gathering satellite data and computing its location, the receiver may be directed to power down to a minimal mode of operation for a programmed interval or until awakened by a hardware interruption. Schedule Track provides hot start performance at a programmed interval or in response to a hardware event. Schedule Track mode provides an advantage over normal battery-backed fast start modes with automatic wakeup to maintain current satellite data for fastest possible acquisition. Schedule Track offers the lowest power consumption in a deep sleep mode but provides position data as quickly as possible when needed.

Ease of integration
Lassen LP GPS provides a choice of data protocols for maximum flexibility. The TSIP binary data protocol incorporates new power management features and provides maximum control over system operation. The TAIP and NMEA protocols are available where ASCII data is preferred. A secondary serial input port is available for RTCM SC-104 differential correction data for high accuracy applications.

The Lassen LP GPS also incorporates Trimble’s antenna detection and protection circuit to monitor the condition of the antenna system. And high performance, miniature 3.3 V antennas are available for the Lassen LP GPS.

Getting started
The Lassen LP Starter Kit provides everything you need to get started integrating state-of-the-art GPS capability into your application.
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PERFORMANCE SPECIFICATIONS

**General**
L1 frequency, C/A code (SPS), 8-channel, continuous tracking receiver, 52 correlators

**Update rate**
- TSIP @ 1 Hz
- NMEA @ 11 Hz
- TAIP @ 1 Hz

**Accuracy**
- Horizontal: <6 meters (50%); <9 meters (90%)
- Altitude: <11 meters (50%); <18 meters (90%)
- Velocity: 0.06 m/sec
- PPS: ±5 nanoseconds
- DGPS accuracy: 2m CEP (50%)

**Position**
2m CEP (50%)

**Velocity**
0.05 m/sec (1 Sigma)

**Acquisition**
- Hot Start: < 15 seconds (90%)
- Warm Start: < 42 seconds (90%)
- Cold Start: < 130 seconds (90%)
- Cold start requires no initialization. Warm start requires last position, time and almanac saved in battery back-up memory. Hot start requires that the ephemeris also saved.

**Operational limits**
- Temperature: –40°C to +85°C (standard)
- Storage temp: –55°C to +100°C
- Vibration: 0.008 g
- Acceleration: 4 g (39.2 m/sec²)
- jerk: 4 g (5 g/μsec²)
- Altitude: <18,000 m or velocity < 515 m/sec
- Battery back-up memory: 60 hours
- Reacquisition after signal loss: < 2 seconds (90%)
- **Dynamics**
- Motional Jerk: 4 g (39.2 m/sec²)
- **Prime power**
- 3.3 V at 12 mA
- ±0.3 V

**TECHNICAL SPECIFICATIONS**

- **Power consumption**
  - +3.3 V DC, ±0.3 V
  - Normal operation: GPS board only: 55 mA, 0.182 W
  - with antenna: 67 mA, 0.221 W
  - Deep Sleep: 8 mA, board only
  - Backup power: +3.3 V to +5.0 V LDC
  - 2-5 μA at +25°C (nominal)
  - Serial ports/1PPS: CMOS TTL levels

- **Supported Protocols:**
  - TSIP @ 9600 baud, 8-Odd-1 (configurable)
  - TAIP @ 4800 baud, 8-None-1 (configurable)
  - NMEA 0183 v2.1 @ 4800 baud, 8-None-1 (configurable)
  - RTCM SC-104 @ 4800 baud, 8-None-1 (configurable)
  - GGA, VTG, GLL, ZDA, GSA, GSV and RMC messages selectable by TSIP command; selection stored in non-volatile memory.

- **Antenna power**
  - 3.3 V at 12 mA
  - Open-circuit detection
  - Short-circuit protection

**PHYSICAL CHARACTERISTICS**

**Dimensions**
2.605” L x 1.250” W x 0.475” H
(66.167 mm x 31.750 mm x 12 mm)

**Weight**
0.4 oz. (12.5 grams)

**Connectors**
- RF: right-angle MCX
- Power, I/O: 8-pin (2 x 4), 2 mm header

**ACCESSORIES**

- **Compact Magnetic-Mount 3V GPS Antenna**
  - Compact, 3.3V, magnetic mount, active micropatch antenna with 5-meter cable and MCX connector.
  - 1.65” x 1.99” x 0.55” high (42 mm x 50.5 mm x 13.8 mm)

- **Compact Unpackaged 3V GPS Antenna**
  - Same Basic antenna as compact magnetic-mount 3V GPS antenna listed above, without the external packaging. 3.3V, active antenna with 11-cm cable and right-angle MCX connector.
  - 1.36” x 1.41” x 0.35” high (34.6 mm x 29 mm x 9 mm)

**ORDERING INFORMATION**

**Module**
Lassen LP GPS Module, TSIP (binary) protocol, NMEA 0183 (ASCII) protocol and TAIP (ASCII) protocol, DGPS ready

**Antennas**
- Magnetic-mount 3.3V antenna, 5-meter cable, MCX connector
- Unpackaged 3.3V antenna, 11-cm cable, right-angle MCX connector

**Starter Kit**
Includes Lassen LP GPS module mounted on interface motherboard in a durable metal enclosure with dual DB9, RS-232 interface, AC/DC power converter, compact magnetic-mount GPS antenna, Interface cable, TSIP, NMEA and TAIP protocols, software toolkit for TSIP and manual on CD-ROM.

Visit our website at www.trimble.com/oem

Specifications subject to change without notice

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