Lassen LP GPS

Low power module for portable applications

Trimble's new 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

Actual size

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 a new high performance, miniature 3.3 V antenna is available for the Lassen LP GPS.

Getting started

The Starter Kit makes it easy to evaluate the Lassen LP GPS and begin development.

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PERFORMANCE SPECIFICATIONS

General	L1 frequency, C/A code (SPS), 8-channel, continuous tracking receiver, 32 correlators
Update rate	TSIP @ 1 Hz
	NMEA @ 1 Hz
	TAIP @ 1 Hz
Accuracy	
Position	25 m CEP (50%) w/o SA
Velocity	0.1 m/sec without SA
Time	±95 nano-seconds (over-determined clock mode)
DGPS accuracy	
Position	2 m CEP (50%)
Velocity	0.05 m/sec
Acquisition (typical)	Cold start*: < 130 seconds (90%)
	Warm start**: < 45 seconds (90%)
	Hot start***: < 20 seconds (90%)
Reacquisition after signal loss	< 2 seconds (90%)
Dynamics	
Acceleration	4 g (39.2 m/sec^2)
Motional Jerk	20 m/sec^3
Operational limits	Altitude <18,000 m or velocity < 515 m/sec either limit may be exceeded but not both

ENVIRONMENTAL SPECIFICATIONS

Operating temp	−40°C to +85°C (standard)	
Storage temp	−55°C to +100°C	
Vibration	0.008 g^2/Hz	5 Hz to 20 Hz
	0.05 g^2/Hz	20 Hz to 100 Hz
	−3 dB/octave	100 Hz to 900 Hz
Operating humidity	5% to 95% R.H. non-condensing, +60°C	
Altitude	−400 m to +18,000 m	

TECHNICAL SPECIFICATIONS

Prime power	+3.3 V DC, ± 0.3 V	
Power consumption		
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	+3.0 to +3.6 V DC	
	2–5 µA at +25°C (nominal)	
Serial ports/1PPS	CMOS TTL levels	
I/O Protocols	TSIP (binary data)	
	NMEA 0183 v2.1 (ASCII data)	
	TAIP (ASCII data)	
NMEA messages	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, feedline fault detect/protect	

   * Cold start requires no initialization
  ** Warm start implies last position, time and almanac are saved in battery-backed memory
*** Hot start implies ephemeris also saved.

All GPS receivers are subject to degradation of position and velocity accuracies under Department of Defense imposed Selective Availability (SA).

Visit our website at **www.trimble.com/oem**

Specifications subject to change without notice.

PHYSICAL CHARACTERISTICS

Dimensions	2.605″ L × 1.250″ W × 0.475″ H	
	(66.167 mm × 31.750 mm × 12 mm)	
Weight	0.4 oz. (12.5 grams)	
Connectors	RF:	right angle MCX
	Power, I/O:	8-pin (2 × 4), 2 mm header

ACCESSORIES

GPS antenna Compact, 3.3 V active micropatch antenna with 5-meter cable and magnetic mount. 1.65″ × 1.99″ × 0.55″ high (42 mm × 50.5 mm × 13.8 mm)

ORDERING INFORMATION

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

Antennas
3.3 V antenna, 5-meter cable with MCX connector

Starter Kit
Includes Lassen LP GPS module mounted on interface motherboard in a durable metal enclosure with dual DB9, RS232 interface, AC/DC power converter, magnetic-mount 3 V antenna, TSIP, NMEA and TAIP protocols, software toolkit for TSIP, interface cable and manual.

Manual
Lassen LP GPS Module System Designer Reference Guide