

## Lassen SK II

### *GPS Module for Fast Integration*

#### Key features and benefits

- Power consumption <0.5 W
- Next-generation RF technology
- Reliable performance from -40° to +85°

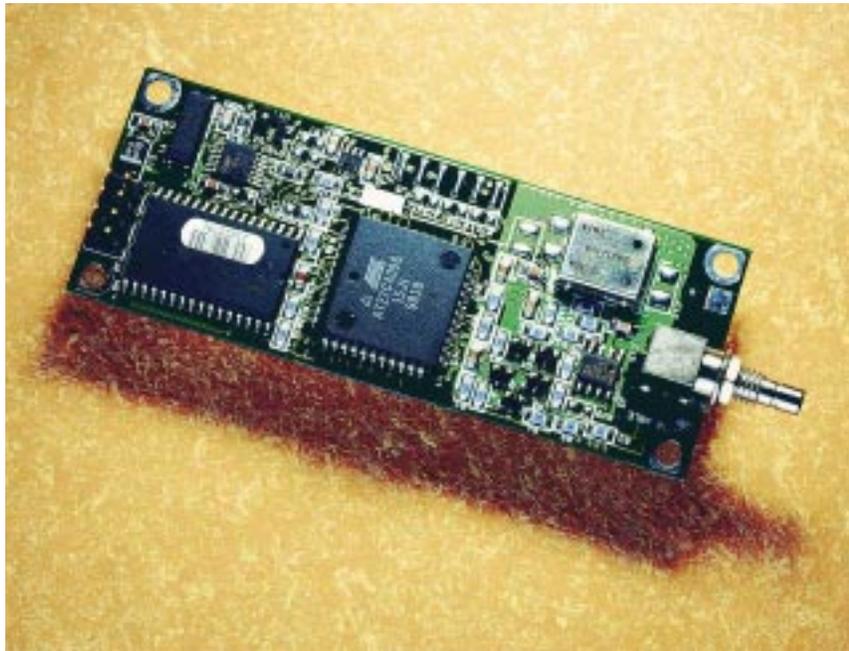
The new Lassen™ SK II GPS module is one of the newest members of Trimble's renowned Lassen line of OEM GPS products for embedded applications.

Lassen SK II builds on the original Lassen-SK8's outstanding performance and success in demanding automotive applications. The Lassen SK II is intended primarily for OEMs and system integrators who require maximum GPS performance, flexible configuration capability and low power usage.

Just two-thirds the size of a business card and fully backward compatible with the Lassen-SK8, Lassen SK II makes use of the latest advances in silicon technology to offer even more robust RF performance. Tighter integration of the RF front end using the new Colossus ASIC has slashed the component count by 25 percent, cutting power consumption to less than 0.5 watts.

#### Top performance

Using Trimble's 8-channel technology, Lassen SK II delivers rapid startup times and reliable performance over the entire -40° to +85° C extended temperature range. Lassen SK II incorporates Trimble's proven software, which outputs highly accurate position data even in areas where satellite signals are weakened by terrain, foliage and structures.



*Actual size*

The Lassen SK II is also differential GPS (DGPS) ready for applications requiring high levels of accuracy. A full-measurement feature is available for advanced applications.

#### Ease of integration

Lassen SK II's user-configurable, dual I/O serial ports mean greater flexibility and fast integration. A choice of three data protocols provides the user with maximum configuration capability. The primary serial port may be configured either to the TSIP (Trimble Standard Interface Protocol) binary data protocol for total control over system operation; or to the easy-to-use

TAIP (Trimble ASCII Interface Protocol), which is ideal for tracking applications.

The secondary serial port outputs NMEA-0183 standard data messages and can receive RTCM SC-104 differential correction data for two-meter DGPS accuracy.

The Lassen SK II also incorporates Trimble's antenna detection and protection features to monitor the condition of the GPS antenna system.

#### Getting Started

Lassen SK II's Starter Kit provides everything you need to get started integrating state-of-the-art GPS into your application.

# Lassen SK II

## GPS Module for Fast Integration

### PERFORMANCE SPECIFICATIONS

General	L1 frequency, C/A code (SPS), 8-channel, continuous tracking receiver, 32 correlators
Update rate	TSIP @ 1Hz; NMEA @ 1Hz
Accuracy	Position: 25m CEP (50%) without SA Velocity: 0.1 m/sec without SA
Time	±95 nano-seconds (over-determined clock mode)
DGPS accuracy	Position: 2m CEP (50%) Velocity: 0.05 m/sec Time: ±500 nano-seconds (nominal)
Acquisition	Cold start: <130 seconds (90%) Warm start: <45 seconds (90%) Hot start: <20 seconds (90%)  Cold start requires no initialization. Warm start implies last position, time and almanac are saved by back-up power. Hot start implies ephemeris also saved.
Reacquisition after signal loss	< 2 seconds (90%)
Dynamics	Acceleration 4g (39.2 m/sec <sup>2</sup> ) Motional Jerk 20 m/sec <sup>3</sup>
Operational limits	Altitude <18,000m or velocity <515 m/sec either limit may be exceeded but not both

### ENVIRONMENTAL SPECIFICATIONS

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

### PHYSICAL CHARACTERISTICS

Prime power	+5V DC, ±5%
Power consumption (nominal)	GPS board only: 95mA, 0.47W With antenna: 120mA, 0.60W
Back-up power	+3.2 to +5V DC 2µA @ +3.5V, +25°C (nominal)
Serial ports/1PPS	CMOS TTL levels
Protocols	TSIP @ 9600 baud, 8-Odd-1 NMEA 0183 v2.1 @ 4800 baud, 8-None-1 RTCM SC-104 @ 4800 baud, 8-None-1
NMEA messages	GGA, VTG, GLL, ZDA, GSV, GSA and RMC messages selectable by TSIP command; selection stored in non-volatile memory
Antenna power	5V at 25mA available Short circuit protection Feedline fault detection

### PHYSICAL CHARACTERISTICS

Dimensions	3.25" L x 1.25" W x 0.40" H (82.6mm x 31.2mm x 10.2mm) without connectors
Weight	0.7 oz. (19.6 g) without optional shield
Connectors	RF: SMB; I/O: 8-pin (2x4), 0.100" header

### ACCESSORIES



**GPS antenna** Compact, active micropatch antenna with 5-meter cable and magnetic mount. 1.65" x 1.99" x 0.55" high (42mm x 50.5mm x 13.9mm)



**Hard mount antenna** Compact, hard mount, active micropatch antenna with single-hole 0.75" threaded mount and TNC connector. 2.46" diameter x 0.75" high (62.6mm x 19.0mm)



**Rooftop antenna** Bullet antenna with 22-meter cable and SMB adapter

**RF shield** Optional snap-on metal cover for severe RF environments

### ORDERING INFORMATION

<b>Module</b>	Part Number <b>38116-00</b>
TSIP (binary) protocol and NMEA 0183 (ASCII) protocol, DGPS ready	
<b>Antennas</b>	
26 dB magnetic mount antenna, 5-meter cable	Part Number <b>34048-00</b>
26 dB hard mount antenna, TNC connector	Part Number <b>28367-70</b>
35 dB rooftop Bullet antenna, 23-meter cable	Part Number <b>23726-00</b>
<b>Starter Kit</b>	Part Number <b>38982-00</b>
Includes Lassen SK II board, interface motherboard in durable metal enclosure with dual DB9, RS-232 interface, AC/DC power converter, magnetic mount antenna, TSIP and NMEA protocols, software toolkit for TSIP, interface cable and manual.	
<b>Manual</b>	Part Number <b>39069-01</b>
Lassen SK II System Designer Reference Guide	

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](http://www.trimble.com/oem)

Specifications subject to change without notice.