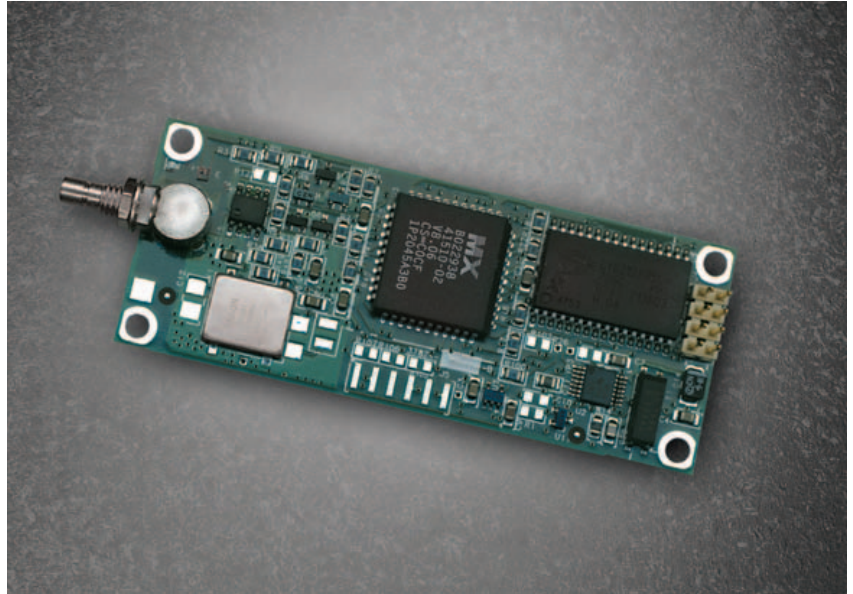# Lassen SK II

GPS Module for Fast Integration

The Lassen™ SK II GPS module is a member of Trimble's renowned Lassen line of OEM GPS products for embedded applications.

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

The Lassen SK II module makes use of the latest advances in silicon technology to offer even more robust RF performance. Tighter integration of the RF front end using trimble's 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, the Lassen SK II module delivers rapid startup times and reliable performance over the entire −40° C to +85° C extended temperature range. The module incorporates Trimble's proven software, which outputs highly accurate position data even in areas where satellite signals are weakened by terrain, foliage and structures. The Lassen SK II module is also differential GPS

Lassen SK II GPS module

(DGPS) ready for applications requiring high levels of accuracy. A full-measurement feature is available for advanced applications.

Ease of integration

The Lassen SK II module'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. Either serial port may be configured to the TSIP (Trimble Standard Interface Protocol) binary data protocol for total control over system operation, to the easy-to-use TAIP (Trimble ASCII Interface Protocol), which is ideal for tracking applications or to output standard NMEA GPS data messages.

The receiver is delivered from the factory with the primary port configured with TSIP In and Out. The secondary port outputs standard NMA-0183 data messages and can receive RTCM SC-104 differential correction data for 2 meter DGPS accuracy.

The Lassen SK II module 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.

Trimble

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; TAIP @ 1Hz

Accuracy:
Horizontal: <6 meters (50%), <9 meters (90%)
Altitude: <11 meters (50%), <18 meters (90%)
Velocity: 0.06 m/sec
PPS: ±95 nanoseconds

DGPS accuracy:
Position: 2m CEP (50%)
Velocity: 0.06 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.

Reacquisition after signal loss: <2 seconds (90%)

Dynamics
Acceleration: 4g (39.2 m/sec2)
Motional Jerk: 20 m/sec3

Operational limits: Altitude <18,000m or velocity <515 m/sec
Either limit may be exceeded but not both.

ENVIRONMENTAL SPECIFICATIONS

Operating temperature: – 40°C to +85°C
Storage temperature: –55°C to +100°C

Vibration:
0.008 g2/Hz 5Hz to 20Hz
0.05 g2/Hz 20Hz to 100Hz
3dB/octave 100Hz to 900Hz

Operating humidity: 5% to 95% R.H. non-condensing, @ +60°C

ELECTRICAL 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)

Antenna power: 5V at 25mA available
Open-circuit detection
Short-circuit protection

INTERFACE CHARACTERISTICS

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

NMEA messages: GGA, VTG, GLL, ZDA, GSV, GSA and RMC messages selectable by TSIP command; selection stored in non-volatile memory

PHYSICAL CHARACTERISTICS

Dimensions: 3.25″ x 1.25″ x 0.40″ (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

Compact Magnetic-Mount 5V GPS Antenna Compact, 5V, magnetic-mount, active micropatch antenna with 5 meter cable. SMA or SMB connector. 27 dB or 35 dB gain. 1.65" x 1.99" x 0.55" high (42mm x 50.5 mm x 13.9 mm)

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

You may visit our website for current information, part numbers and ordering information at: http://www.trimble.com/lassenskii.htm

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

Antennas
27 dB magnetic-mount 5V antenna, 5-meter cable, SMA Connector
27 dB magnetic-mount 5V antenna, 5-meter cable, SMB Connector
35 dB magnetic-mount 5V antenna, 5-meter cable, SMB Connector
28 dB Hard mount antenna, TNC connector
35 dB rooftop Bullet antenna, 23-meter cable

Starter Kit Includes Lassen SKII GPS module mounted on interface motherboard in a durable metal enclosure with dual DB9, RS-232 interface, AC/DC power converter, compact manetic-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

Trimble Navigation Limited is not responsible for the operation or failure of operation of GPS satellites or the availability of GPS satellite signals.