NAV-2100

GLOBAL POSITIONING SYSTEM RECEIVER CHIPSET

OVERVIEW

The NAV-2100 is a 12-channel Global Positioning System Receiver (GPSR) chipset within a complete reference design. It is designed around a programmable platform - the Analog Devices ADSST-NAV-2100 fixed-point Digital Signal Processor with on-chip SRAM and integrated I/O peripherals support. The NAV-2100 chipset together with a standard RF front end and GPS antenna forms a complete GPS receiver design.

NAV-2100 GPS Receiver Board

The NAV-2100-based GPS Receiver board has two footprints: 40 mm × 60 mm or 50 mm × 70 mm. This board uses a commercially-available RF front end, band pass filters, low noise amplifier and reference clock. When connected to an active antenna and a power supply, it outputs position, speed, direction and time data through its serial port, in the industry-standard NMEA0183 format.

Building Block for OEM Applications

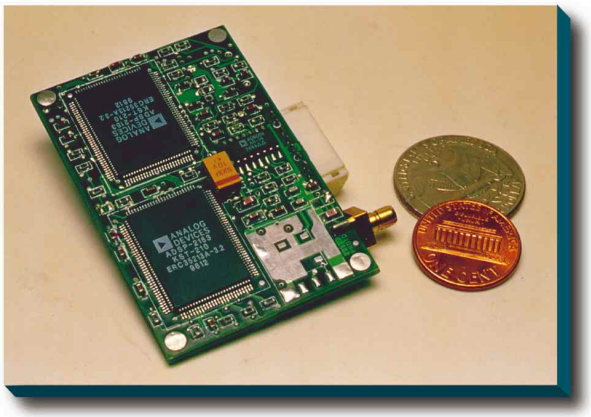
The NAV-2100, with its spare processing power, becomes an ideal building block for versatile OEM applications. This approach minimizes the additional processing hardware requirements for integrated GPS-based OEM applications resulting in a cost-effective end product.

NAV-2100 Evaluation Kit

The evaluation kit is a good beginning for gaining familiarity with the different features of NAV-2100.

This consists of:

Slot No.	Description
1.	NAV-2100 GPS receiver unit consisting of : i. NAV-2100 GPS receiver board ii. Motherboard (for power supply and host communications ports) iii. Antenna and RS-232 Connectors iv. Ruggedized metallic enclosure
2.	Antenna with cable
3.	RS-232 cable and power cable
4.	GVISION, PC-based user interface software on a 3½" disk (provides information such as user position, velocity, heading, waypoint navigation in text and graphic form).
5.	NAV-2100 User's Guide



NAV-2100 GPS Receiver Board

HIGHLIGHTS

- Single Frequency Standard Positioning Service
- Twelve Parallel Channels
- Efficient Algorithms for Very Low Time To First Fix (TTFF), Even Without Almanac
- Software Solution Approach to Correlation
- Easy Upgradability and Expandability
- Spare Processing Power for Additional Features and Integrated Applications
- Carrier-Aided Tracking
- Supports 47 Geodetic Data
- NMEA0183-Compatible Message Format for Host Communication
- Real-Time Executive-Based Software Architecture
- DGPS Compatibility

ANALOG DEVICES

NAV-2100 Specifications

Performance Characteristics

- **Receiver** 12 channels L1-C/A code SPS
- **Time to First Fix**
  - **Hot Start** (with ephermis, position and time) 20 seconds (typical)
  - **Warm Start** (with almanac, position and time estimate) 45 seconds (typical)
  - **Cold Start** (without almanac, time, position) 65 seconds (typical)
- **Accuracy**
  - **Position (Horizontal)** 20 meters (1σ without S/A)
  - **Velocity** 0.1 meters/sec (1σ without S/A)
- **Dynamics**
  - **Velocity** 600 m/sec
  - **Acceleration** 4 *g*
  - **Jerk** 7 m/sec^3
- **Reacquisition**
  - **Signal** Less than 1 second
  - **Position** 1.5 seconds (typical)
- **Satellite Data Collection** 6 seconds to 9 seconds for synchronization

  Continuous data collection and parity checking on all twelve channels
- **Elevation Mask Angle for Satellite Visibility** 5°
- **Position Solution** 2D/3D position, velocity and time

  47 geodetic datum supported (default WGS84)
- **Position Update Rate** 1 second

Physical Characteristics

- **Board Dimensions** 40 mm × 60 mm × 12 mm (+3.3 V) or 50 mm × 70 mm × 12 mm (+5V)
- **Connectors** SMB receptacle (RF signal input)
- **Weight** 40 g (typical)

Electrical Characteristics

- **Power Supply Voltage** +5 V/+3.3 V
- **Power Consumption** 850 milliwatts

PC/Host Communication

- **Interface** RS-232 compatible
- **Baud Rate** 9600 baud
- **Message Formats** NMEA0183 Ver. 2.00, ASCII, as well as Accord's proprietary binary
- **Start Bits** 1
- **Data Bits** 8
- **Stop Bits** 2
- **Parity Check** No

Output Messages

Binary
User's present position in terms of Latitude, Longitude, Altitude, ECEF coordinates, Speed, Heading, Time, DOP, Receiver status, Satellite data, Error messages, Almanac.

NMEA
$GPGGA, $GPGSA, $GPRMC, $GPVTG, $GPZDA, $GPGSV, $GPGLL

Input Messages *(Binary)*

Force satellite reselection, Master reset, Almanac, Position, Time, Date, Geodetic datum, Message Control and Configuration.

Application Interface *(Optional)*

The Real-Time Executive of NAV-2100 provides a programmatic interface to integrate OEM application software.

Environmental Characteristics

- **Operational Temperature Range (Ambient)** –45°C to +85°C
- **Storage Temperature Range** –65°C to +150°C
- **Humidity** 95% noncondensing +30°C to +60°C
- **Altitude** 18,000 meters

Ordering Information

The NAV-2100 GPS Receiver Design Kit is available under part number ADSST-NAV-2100.

The NAV-2100 GPS Receiver chipset can process other algorithms on the same DSPs, eliminating the need for separate subsystems.

Analog Devices, Inc., together with Accord Software & Systems Pvt. Ltd., is developing the most advanced system receiver solutions today. Accord is based in Bangalore, India.

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