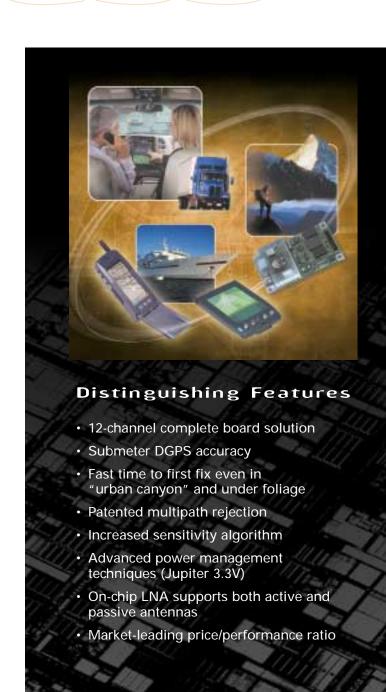**CONEXANT**™

Jupiter GPS Receivers

New Upgraded and Extended Jupiter Family of GPS Receivers

Delivering high performance at a low price, Conexant's Jupiter family of GPS receivers opens the market for a growing range of consumer applications — from handheld and automotive GPS receivers to marine, precision farming, and industrial applications — supplying solutions for an increased demand for turnkey board-level GPS receiver systems at a low cost point. Conexant's revolutionary, fully featured Jupiter GPS receiver boards enable OEMs to capitalize on emerging GPS markets with an advanced technology solution that facilitates the production of end products in record time. The Jupiter boards break the GPS receiver price/performance barriers, offering cutting-edge GPS technology with exceptionally rapid design-in times.

Jupiter 3.3V (TU30-D400)	low-cost, low-power GPS board solution: designed for battery-operated, handheld devices
Jupiter 3.3V+H/A (TU30-D430)	an added Hardware Accelerator (H/A) enables industry-leading acquisition times
Jupiter 3.3V+DR (TU30-D420)	ideal for in-car navigation; Dead-Reckoning software allows for signal acquisition in urban canyon and thick foliage environments
Jupiter 5V (TU30-D410)	maintains last known position and satellite information for rapid acquisition, by utilizing vehicle's continuous battery power
Jupiter 5V+FLASH (TU30-D230)	the most flexible option; features a 2Mbit on-board Flash memory device that can be reprogrammed by the OEM

Distinguishing Features

- 12-channel complete board solution
- Submeter DGPS accuracy
- Fast time to first fix even in "urban canyon" and under foliage
- Patented multipath rejection
- Increased sensitivity algorithm
- Advanced power management techniques (Jupiter 3.3V)
- On-chip LNA supports both active and passive antennas
- Market-leading price/performance ratio

Jupiter GPS Receivers

Flexible and Reliable

Jupiter is the first board-level product to use the revolutionary Zodiac chipset — a quantum leap in GPS technology. Jupiter boards feature two serial ports, on-board LNA (active or passive antenna), full temperature range, and Inmarsat interference rejection — all in a small form factor. Furthermore, Jupiter is offered in several styles, with a selection of RF connector types: Jupiter 3.3V (TU30-D400), Jupiter 5V (TU30-D410), Jupiter 3.3V with Dead Reckoning (TU30-D420), Jupiter 3.3V with Hardware Accelerator (TU30-D430), and Jupiter 5V with Flash memory (TU30-D230), all with the same proven reliability in harsh environments. Jupiter 3.3V offers dramatic power savings achieved when reducing supply power to 3.3V, and additional power savings through power management. Jupiter Flash provides expanded memory capacity and reprogrammable firmware for custom development and in-field updates. Jupiter 3.3 V with Dead Reckoning adds support for OEM-supplied rate gyroscope and connections to a vehicle's wheel ticks to extend GPS capabilities in areas of significant signal blockage or disruption, such as in tunnels, parking garages, or even the worst urban canyons. And Jupiter 3.3V with Hardware Accelerator provides the Jupiter with extremely fast, state-of-the-art time to first fix (TTFF), and even more dramatic power savings of up to 70% compared to the Jupiter 3.3V.

Because of it's 12 parallel channels and highly sensitive RF front end, Jupiter provides rapid GPS signal acquisition and reacquisition, smooth ground tracks, and a high percentage of time in navigation, even in demanding "urban canyon" and high-foliage environments. Firmware improvements enhance overall performance and functionality, and enable GPS receivers using Conexant technology to navigate more precisely. In addition, the new power management option (Jupiter 3.3V), reduces power consumption by 75% as compared with the standard Jupiter 5V configuration. An on-chip low noise amplifier (LNA) provides the flexibility to use either a low-cost passive antenna or an active antenna when required by the application.

Integrated Solution

OEMs have the option of using navigation solutions provided by the Jupiter boards or using Jupiter's raw data measurements of pseudorange, pseudorange rate, and continuous carrier phase to compute a customized, highly integrated solution in a separate processor. Because it is provided as a feature-rich and fully assembled/tested board, Jupiter represents a high-performance, flexible GPS component for a wide variety of end-product applications.

Patented Algorithm Enhances Accuracy

Conexant's software includes a patented algorithm to greatly reduce the effects of multipath. The software produces solutions of much higher quality than other receivers, especially amid the tall buildings and other obstructions found in large cities. When the algorithm is coupled with the DR sensor input, tracks follow the road more often with fewer excursions from the truth and fewer extraneous instrument recalibrations.

Jupiter GPS Receivers

Jupiter 3.3V (TU30-D400)

This low-cost, low-power unit is designed for embedded applications where power is at a premium, such as hand-held devices. The Jupiter 3.3V offers full-Jupiter performance at a modest 429 mW, ensuring longer battery life for portable applications. In addition to being powered by 3.3V, the Jupiter 3.3V utilizes Conexant's power-management algorithms which reduces overall average power consumption to under 225 mW, or approximately 25% of the power used by the standard Jupiter configuration. In the power-management mode, the receiver automatically turns off the RF portion of the hardware at brief intervals, then turns it back on so accurate positioning signals can be obtained. As a result, the receiver works on full power as little as 33% of that time, yet is still able to provide accurate positions. The user-selectable capability enables the end user to turn off power management in very harsh environments where the signal may not be present at all times, or to reduce the off-time for moderate environments.

Jupiter 5V (TU30-D410)

This configuration is optimized for embedded vehicle applications where battery power is continuously available. By maintaining last known position and satellite information, a navigation solution within seconds of the vehicle being started is possible.

Jupiter 3.3V + DR (TU30-D420)

The harsh crowded downtown environment with signal blockage, signal reflection and RF interference, presents a significant challenge to precision GPS navigation. In embedded vehicle applications, the receiver accepts aiding from an on-board gyro and wheel-tick sensor to enable the system to maintain an accurate solution until GPS tracking is restored.

Jupiter 3.3V + H/A (TU30-D430)

This configuration is designed for applications where lightning-fast acquistion or extremely low power consumption is a priority requirement. With this option, acquisitions in less than 40 seconds without prior knowledge of position, time or satellite information is typical. Once in normal operation, the receiver can operate on 70% less power.

Jupiter 5V + Flash (TU30-D230)

Offering greater flexibility than ever before, the Jupiter Flash is a 5V board featuring a 2 Mbit (128 K x 16) on-board Flash memory device that can be reprogrammed by the OEM. The Flash download driver is contained in the boot code that is programmed permanently into the Flash memory. Now, in-field firmware updates can ensure the board will remain current with future software enhancements. With available API and software development tools, the OEM can develop and load custom programs and harness excess on-board microprocessor capacity. The board also contains expanded EEPROM memory for added OEM utility.

Zodiac Chipset

The market-leading Zodiac GPS chipset is for high-volume OEMs requiring a low cost and truly high-performance 12-channel GPS for custom-integrated applications. Consisting of the Gemini/Pisces Monopac™ device (RF, downconversion and A/D) and Scorpio DSP, the proven design along with extensive Conexant applications experience assures high-performance results with minimum development costs. The embedded 44 MHz microprocessor can be accessed for OEM applications. The Zodiac program includes training, complete reference design including all layout files and drawings, API and software design tools, hardware emulator, and production management assistance.

Worldwide Development Support

To enable OEMs to achieve successful, low-cost, rapid product development based on the Jupiter family of board products, Conexant provides comprehensive documentation with each Jupiter Development Kit and offers technical product support through its worldwide network of regional sales offices.

Product Features

General
- **Receiver Architecture**
  - 12-channel, L1 1575.42 MHz
  - C/A code (1.023 MHz chip rate)
  - Code-plus-carrier tracking (carrier-aided tracking)
  - Velocity (> 500 m/s)
  - Acceleration up to 5G
- **Tracking Capability**
  - 12 satellites simultaneously
- **Accuracy**
  - Horizontal accuracy < 3 meters (CEP), 5 meters 2 dRMS
  - 3D accuracy < 5 meters (SEP)
  - DGPS accuracy < 1 meter (CEP)
  - Timing accuracy < 100 ns (absolute), < 40 ns (1sigma)
- **Acquisition/Reacquisition Performance (typical)**
  - With Hardware Accelerator:
  - < 8 seconds TTFF with time, position, ephemeris
  - < 35 seconds TTFF with almanac, time, position
  - < 40 seconds TTFF (cold start)
  - < 1 second reacquisition

- Without Hardware Accelerator:
  - < 23 seconds TTFF with time, position, ephemeris
  - < 45 seconds TTFF with almanac, time, position
  - < 120 seconds TTFF (cold start)
  - < 1 second reacquisition
- **Antenna**
  - On-board LNA for use with passive antenna
  - Active antenna powered through receiver (100 mA max at 12 VDC max)
- **Datums**
  - 189 standard datums, 5 user defined, default: WGS-84

Serial Interfaces
- **I/O Messages**
  - 2 serial ports available
  - CMOS-level
  - Programmable baud rates
  - Latitude, longitude, elevation, velocity, heading, time, satellite tracking status, command/control messages, raw data (Conexant Binary Interface)

- NMEA-0183 version 2.1 (selected formats)
- RTCM SC-104 DGPS on auxiliary or primary port

Electrical –
Jupiter 5V and Jupiter 5V Flash Configuration
- **Power Requirements**
  - 5V ± 10 %, 50 mV p-p ripple (maximum)
- **Backup Power (SRAM and RTC)**
  - 75 µA (typical), 2.5V to 5V
- **Power Consumption**
  - 975 mW at 5V (typical)

Electrical –
Jupiter 3.3V, Jupiter 3.3V Hardware Accelerator and Jupiter 3.3V DR Configurations
- **Power Requirements**
  - 3.3V ± 5 %, 150 mV p-p ripple (maximum)
- **Backup Power (SRAM and RTC)**
  - 40 µA (typical), 2.5V to 3.3V
- **Power Consumption (typical)**
  - 429 mW at 3.3V
  - 221 mW at 3.3V (with power management)

Physical
- **Dimensions**
  - Receiver 1.6″ x 2.8″ x 0.5″
- **Weight**
  - 0.85 oz. (25 grams)
- **Connectors**
  - Data/power: 20-pin (2x10 pins) on 2 mm centers
  - RF: right angle or vertical OSX, or right angle SMB

Environmental
- **Operating Temperature**
  - -40ºC to +85ºC
- **Humidity**
  - Up to 95% noncondensing or a wet-bulb temperature of +35ºC, whichever is less
- **Altitude**
  - -1,000 feet to 40,000 feet
  - Up to 150,000 feet with environment enclosure
- **On-Board Filtering**
  - In-Band
  - -7 dB L1 -75 MHz
  - -20 dB L1 +50 MHz

For more information on this or other TTM System Solutions products, please contact us at:
Toll Free Phone: (877) 387-7304
Email: systemsolutions@conexant.com

Monopac and Zodiac are trademarks of Conexant Systems, Inc.

C O N E X A N T ™
What's next in communications technologies