

Positioning solution Jackson Labs, USA

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Jackson Labs Technologies, Inc. – Timing and Frequency Solutions using u-blox GNSS

Jackson Labs Technologies, Inc. (JLT) offers a wide range of Timing, Frequency, Position, and Navigation (PNT/PVT) solutions to the telecom, R&D, oil-exploration, military, SDR, and aviation markets. Products offer highly-stable UTC-synchronized reference frequencies and pulse-per-second signals that allow synchronization to nanosecond levels anywhere in the world. Various oscillator technologies such as Cesium, Rubidium and Double Ovenized Crystal oscillators (DOCXO's) provide a fly-wheel for the GNSS reference signals allowing both phase noise to below -115dBc/Hz at 1Hz offset, as well as phase-coherence in holdover mode of better than 300ns over 24 hours, with jitter in the femtoseconds.

Challenge

Cheap Chinese-made GPS jammers are beginning to show up in ever larger quantities and are being used illegally by truckers and others, and cause significant disruption to cell-towers, aircraft, power-generation facilities, and other critical infrastructure. Even low-cost GPS spoofers have recently been made available to the general public.

The u-blox solutions

Using a multi-GNSS reception system mitigates the effects of these jammers/spoofers by allowing concurrent operation of different GNSS systems and carrier frequencies. The latest u-blox M8T modules offer a key market advantage in that they allow operation of three concurrent multiple GNSS systems which provides a significant operational safety margin, and allows operators to rely on lower-cost flywheel oscillators than were used before. A typical emerging 4G/5G cell-site deployed in very large quantities around the world may now operate on a lower-cost DOCXO rather than a higher-end Rubidium oscillator, saving considerable deployment cost. Further benefits arise in having an over-determined timing solution by utilizing the u-blox M8T Auto-Survey and Position Hold operation modes which allow operation with down to a single satellite in view. Concurrent GNSS reception is also critical for small-cell applications which are typically mounted inside shopping malls, tunnels, and urban-canyon environments where a clear line-of-sight to the sky is unavailable and highly obstructed. The latest u-blox receivers with multi-GNSS and indoor-reception capability have proven themselves very capable in these types of challenged applications, and allow operation in environments that were heretofore not possible. For highly-dynamic mobile applications such as encountered in aircraft, JLT takes advantage of the u-blox receivers' capability to have adjustable Kalman loop time constants as well as Carrier Phase versus Doppler Tracking modes. The JLT software analyzes the dynamic environment

using accelerometers and the PVT data from the u-blox receiver and adjusts the u-blox Kalman filters in real-time to the most optimal setting. This allows JLT products to track UTC(GNSS) to within nanoseconds in any type of application and environment.

"u-blox GNSS receivers have shown nanosecond UTC(GNSS) timing accuracy with deep sub-meter horizontal position accuracy at low power and with very fast time to first fix (TTFF) which allows us to provide products with exceptionally low phase noise, very high Allan Deviation (ADEV) performance, and very fast warmup and stabilization time. The latest generation u-blox receivers already support Galileo tracking which promises a large step forward in position and timing performance over the decades-old GPS and Glonass systems by using the latest technologies, including Hydrogen-Maser references in the satellites. We are excited to offer numerous products including the Mini-JLT, the Low Noise Rubidium GNSSDO and our M12M Replacement Receiver that include this enhanced capability today," said Said Jackson, President of Jackson Labs Technologies, Inc.

About Jackson Labs Technologies, Inc.

Jackson Labs Technologies, Inc., located in Las Vegas, NV, USA, is a privately held company that designs and manufactures precision Timing, Frequency, and Test & Measurement instruments based on the latest RF, Microprocessor, and Software technologies. Jackson Labs Technologies, Inc. strives to provide extraordinary electronic instruments that consistently outperform competitive products at price points that allow users with tight budgets to purchase our equipment. Since 2005 Jackson Labs Technologies, Inc. has delivered critical Timing and Frequency solutions in large quantities, at lower cost, and with higher performance than comparative products. Jackson Labs Technologies, Inc. prides itself on being able to design turn-key solutions in record time for our customers.

About u-blox

Swiss u-blox (SIX:UBXN) is a global leader in wireless and positioning semiconductors and modules for the automotive, industrial and consumer markets. u-blox solutions enable people, vehicles and machines to locate their exact position and communicate wirelessly over cellular and short range networks. With a broad portfolio of chips, modules and software solutions, u-blox is uniquely positioned to empower OEMs to develop innovative solutions for the Internet of Things, quickly and cost-effectively. With headquarters in Thalwil, Switzerland, u-blox is globally present with offices in Europe, Asia and the USA. (www.u-blox.com)