

NEW PRODUCT HIGHLIGHTS:

- **Mini-PCIe form-factor GPSDO**
used in transaction timing and embedded Software Defined Radios (SDR)
- **Ruggedized LN Rubidium**
Includes GPS/Glonass/BeiDou receiver, Filter-Oscillator, and enclosure
- **FireFly-IIA SAASM GPSDO** with low-noise DOCXO
- **Low Power HD CSAC GPSDO**
uses only 0.45 Watts

SUPPORT HIGHLIGHTS:

- **New Leapsecond features** for CSAC and FireFly-II type products
- **FW bug fixes** and improvements for CSAC and FireFly-II type products
- **LTE-Lite firmware updates**
Improved performance
- **JLT awarded two Patents**
Two Software Patents awarded
- **FireFox GPSDO Synthesizer 10th anniversary!**



Introduction

2015 marks an important year for Jackson Labs Technologies, with four new products released, and various firmware updates being introduced that add features and improve the performance of our CSAC, LTE-Lite, and FireFly-II based products. Two US patents were issued on our software. We mark the 10th anniversary of the introduction of the ground breaking FireFox GPSDO Synthesizer product that started it all. With many 10's of thousands of successful product installations world-wide in the interim, we could not have done any of this without you, the customer.

New Products - Low Noise Rubidium Reference Oscillator

The new Low Noise Rubidium Reference Oscillator marks the first Rubidium reference that JLT offers. The LN Rubidium Reference builds upon, and is backwards compatible to our LN CSAC GPSDO product line. The advantages of Rubidium based oscillators versus our large selection of Cesium (CSAC) based products is that these Rubidium units have better Phase Noise, better ADEV performance, lower thermal sensitivity (more than 5x lower), better holdover performance, longer lifetime and MTBF, and lower cost.



The Low Noise Rubidium Reference uses a Microsemi Miniature Rubidium clock, comes in a ruggedized, Gold plated enclosure with only 3.4" x 4.4" x 1.0" size, includes a GNSS receiver with GPS/Glonass/BeiDou/QZSS/SBAS support, has an ultra-low-phase noise filter oscillator, and has a built-in avionics power supply with +8V to +36V operation. Power consumption is <5.6W steady state. The biggest improvement over competitive units is the Phase Noise and ADEV short term stability performance of the unit.

2015: Celebrating the FireFox GPSDO Synthesizer 10-year Anniversary!



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Low Noise Rubidium Reference Oscillator, Cont'd

ADEV performance of $<4E-013$ from 1s to 10s is achievable with the Premium Oscillator ordering option. Phase Noise performance of -115dBc/Hz at 1Hz offset and a noise floor of $<-170\text{dBc/Hz}$ is also typical with the Premium ordering option. The PC board itself supports interfacing to an external status LCD, RS-232, RS-422, and USB connectivity, support for external 1PPS sources with 20ps time capture resolution, four 10MHz outputs, one 5MHz output, three 1PPS outputs, and extensive Built-In-Self-Test (BIST) features. Communications and Control are handled via extensive NMEA support as well as industry-standard SCPI English-language commands.



New Products – Mini-PCIe GPSDO Module

The JLT Mini-PCIe form-factor GPSDO module is a true analog-disciplined high-stability crystal oscillator module that allows the generation of very low phase-noise and ADEV frequencies inside embedded PC's, netbooks, notebooks, and other computer systems that support standard Mini-PCIe slots. The product is a complete GPSDO and supports GPS, QZSS, and SBAS reception, as well as providing NMEA compliant sentences and a 1PPS pulse to the host computer for NTP-type applications. The unit also has various CMOS 20MHz, 1PPS, and Lock Status outputs on integrated U.FI connectors. The unit can operate with an indoor GPS antenna and provides holdover capability from its integrated high-stability compensated crystal oscillator. Typical applications are embedded Software Defined Radio (SDR), Financial Transaction time-stamping at the retail level, and any other application that requires NMEA GPS sentences alongside 20MHz low-phase noise, and high-stability 1PPS references. Pricing starts at \$220 for single unit quantities.



New Products – SAASM FireFly-IIA GPSDO

JLT has now introduced three variants of its SAASM GPSDO, with this latest unit integrating a highly stable and low-noise Double Oven Oscillator (DOXCO). In contrast to competitor's offerings that use only off-the-shelf navigation-SAASM receivers, this unit uses a custom-modified SAASM GPS receiver that has been specifically optimized for timing applications. This provides mission-critical SAASM capability with phase noise as low as -105dBc/Hz at 1Hz offset and ADEV performance of better than $6E-012$ typically from 0.1s onward. g-sensitivity is 0.3ppb per g per axis, and thermal sensitivity of 0.2ppb from -20C to $+85\text{C}$ are standard. The SAASM FireFly-IIA GPSDO has been granted Security Approval by the GPS Directorate, and is shipping today. Units can be ordered through the GPS Directorate's STARS website.

New Products – Low Power HD CSAC

The JLT Low Power HD CSAC offers an upgrade path for the popular HD CSAC GPSDO. The unit operates from a 5V power supply and consumes as little as 0.45W steady state. This is a 60% reduction in power consumption from previous CSAC GPSDO products, while at the same time providing the same features and performance as the legacy HD CSAC GPSDO.



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Support Highlights – New Firmware Releases

The latest CSAC firmware version 0.73 and FireFly-II firmware version 2.44 add new Leapsecond-related features that can be accessed with the PTIM:LEAP? commands. This software release is compatible to all the FF-IIA and CSAC related products such as ULN-1100, ULN-2550, Mini-JLT, LC_1x1, HD CSAC, LN CSAC, and others.

These updates include the following new commands:

- ptime:leap:pend? (indicates a pending leapsecond)
- ptime:leap:acc? (current UTC-GPS offset)
- ptime:leap:date? (date of next event)
- ptime:leap:dur? (duration of minute during leapsecond event)

Leapsecond handling is also improved to provide a more consistent leapsecond event handling on these firmware releases. Additional improvements have been made to the firmware to address the GPS lock time when experiencing a reset or power cycle while airborne on products that are using uBlox timing receivers with Position Hold capability such as on the CSAC GPSDO and Mini-JLT products. These new fw revisions also fix a sign issue on the PASHR vertical velocity parameter, as well as improving NMEA compatibility during extended holdover periods. These firmware updates can be downloaded from the support page on the JLT website, and upgrade instructions are available in the relevant products' user manuals.

Support Highlights – New Firmware for LTE-Lite

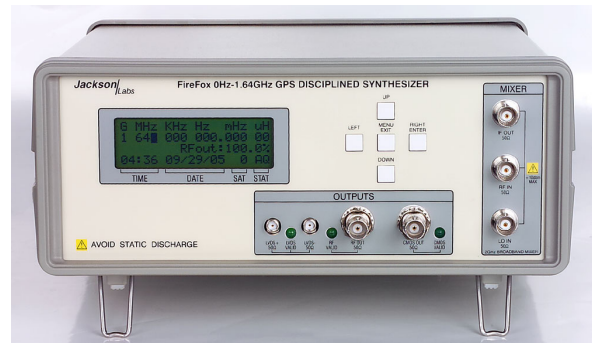
A new firmware release for the LTE-Lite products fixes an issue in the Leapsecond handling (Leapsecond corrections are potentially being applied too early) for units that operate in Flash Boot mode with Position Hold mode enabled. The latest LTE-Lite firmware update also combines the NMEA \$PJLTS proprietary oscillator status string with the GPS NMEA strings onto one single serial port for easy parsing of PVT data as well as oscillator lock status and hardware health. Units can be returned to the factory for a cost-free firmware upgrade, and RMA's can be issued by contacting support@jackson-labs.com

Corporate Highlights – Patent Awards

Jackson Labs Technologies was recently awarded two patents that cover proprietary software processing algorithms used to improve the performance of our products. These patents are US Patent No. 8,988,151 and US Patent No. 8,362,845.

Corporate Highlights – Celebrating 10 Years

2015 marks the 10th anniversary of the introduction of the FireFox GPS-Disciplined Synthesizer. This product presented a ground-breaking combination of wide-band synthesizer performance with micro-Hertz resolution and parts per trillion accuracy made possible by the industries' first integration of a GPS Disciplined DOCXO reference and the synthesizer electronics onto one cost-effective circuit board. The FireFox Synthesizer laid the ground-work for the highly successful JLT GPSDO product-line, and paved the way for a new level of performance in timing, frequency, and synchronization.



Please call us at +1 (702) 233-1334 or visit our website to download specsheets, firmware files, product support applications, white-papers, user-manuals, and press releases for these new products.

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