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FIELD SERVICE BULLETIN

FSB #: 098-50620-004

DATE: November 20, 2008

System: XL-GPS Time and Frequency Receiver

Issue: Potential one second time error during the 90 day period prior to a scheduled leap second event

Product Code:

Description:

CLEI Code: N/A

1530-602

XL-GPS Time and Frequency Receiver

Technical Support: Worldwide 1-408-428-7907 (1) (1) or USA toll free 1-888-367-7966 (1) (1)

Customer Relations: Worldwide 1-408-428-7907 (2) (1) or USA toll free 1-888-367-7966 (2) (1)

NOTE: Find a copy of this FSB in the Support section on the Symmetricom website:

<http://www.symmetricom.com/support/online-support/ttm-product-support/field-service-bulletins/>

General Behavior:

XL-GPS Time and Frequency Receivers manufactured prior to November 1, 2008 may develop a one second time of day error due to improper leap second handling. The time error is the result of an improper leap second insertion three months before a scheduled leap event. Clocks of affected XL-GPS units will be one second behind UTC until the day after the scheduled leap second takes place or the XL-GPS is rebooted.

December 31, 2008 Leap Second Event

A leap second insertion is scheduled for December 31, 2008. Affected XL-GPS units operating during the September – October month rollover will experience an improper leap second insertion on October 1, 2008 at 00:00:00 UTC resulting in the XL-GPS clock being one second behind UTC.

XL-GPS Clock	UTC
Sept 30 23:59:58	Sept 30 23:59:58
Sept 30 23:59:59	Sept 30 23:59:59
Sept 30 23:59:59	Oct 1 00:00:00
Oct 1 00:00:00	Oct 1 00:00:01
Oct 1 00:00:01	Oct 1 00:00:02

The one second time error will persist until the GPS system provides updated information on the day after the scheduled leap second occurs on December 31, 2008. *A reboot of the XL-GPS will clear the time error and insure that the leap second insertion is properly handled on December 31 without any further action by the user*

Cause:

The time error is due to improper processing of the leap second information passed from the internal GPS Receiver Module (87-8028-2) to the XL-GPS CPU.

Recommended Actions:**Immediate Solution:****System Reboot**

Units that exhibit this problem can be rebooted to reinstate the proper UTC time upon re-acquisition and lock to GPS. The XL-GPS can be rebooted by cycling power or using the **F100 KILL command**. A reboot of the XL-GPS will clear the time error and properly handle the leap second insertion when it is scheduled. *The XL-GPS clock will maintain UTC synchronization up until 90 days before the next leap second is scheduled without any further user action.*

Long Term Solution:**Field Upgrade (Recommended)**

Symmetricon is developing a field upgradeable software solution which is anticipated to be available in December 2008. When available, a Product Change Notice (PCN) will be posted on www.symmetricon.com. This software update will insure properly handling of future leap second events without user intervention.

Factory Upgrade

A factory upgrade to the internal GPS Receiver Module (87-8028-2) and the XL-GPS software is expected to be available in December 2008 which will insure proper handling of future leap seconds events.

Additional Information:**XL-GPS Software Versions and Leap Second Performance**

The combination of XL-GPS system and GPS Receiver Module software versions impact how leap seconds are managed by the XL-GPS. The following information is provided to allow customers to determine the XL-GPS system and GPS Receiver Module software versions and respective leap second performance.

To verify the installed XL-GPS system and GPS Receiver Module software versions, use commands F18 and F119 (respectively), via Keypad, Telnet, or RS-232 port as described in the XL-GPS User Guide (<http://www.symmetricon.com/media/files/support/ttm/product-manual/997-01530-01.pdf>).

F18: The XL-GPS software version is identified with the last three characters following the PROJ REV # x.xx. For example: PROJ REV #1.82.1.9 identifies XL-GPS software version 1.82.1.9.

F119 S

The GPS Receiver Module software version is identified in the last three digits of the number following SOFTWARE. For example: SOFTWARE 230-01510-04v1.18 identifies software version 1.18.

The chart below details the XL-GPS clock performance per the combination of the XL-GPS system and GPS Receiver Module software versions related to the scheduled leap second event of December 31, 2008.

XL-GPS Software Version (F18)	GPS Receiver Module Software (F119) Version 1.18	GPS Receiver Module Software (F119) Version 1.20
Version 1.82.1.9 or earlier	A one second error manifests in the XL-GPS clock on October 1, 2008 at 00:00:00 UTC. Requires XL-GPS system reboot (power cycle or F100 kill command) to restore synchronization to UTC. After reboot, the XL-GPS will correctly handle the leap second insertion on December 31, 2008. <i>If no action is taken</i> (i.e. no reboot), the XL-GPS clock will be one second behind UTC from Oct 1 through Jan 1. The XL-GPS clock will resynchronize to UTC when the GPS system transmits the new leap second information on Jan 1. The XL-GPS clock will then continue to maintain synchronization with UTC until 3 months prior to the next scheduled leap second when the above clock behavior will repeat, if no upgrades have been applied.	A one second error manifests in the XL-GPS clock on October 1, 2008 at 00:00:00 UTC. Requires XL-GPS system reboot (power cycle or F100 kill command) to restore synchronization to UTC. After reboot, the XL-GPS will correctly handle the leap second insertion on December 31, 2008. <i>If no action is taken</i> (i.e. no reboot), the XL-GPS clock will be one second behind UTC from Oct 1 through Jan 1. The XL-GPS clock will resynchronize to UTC when the GPS system transmits the new leap second information on Jan 1. The XL-GPS clock will then continue to maintain synchronization with UTC until 3 months prior to the next scheduled leap second when the above clock behavior will repeat, if no upgrades have been applied. A field upgrade to XL-GPS software project version 2-0 is recommended when available in December 2008.
Version 2-0 <i>(To be released December 2008)</i>	Properly maintains the XL-GPS clock and synchronization to UTC before, during and after the leap second event of December 31, 2008 and future leaps events.	Properly maintains the XL-GPS clock and synchronization to UTC before, during and after the leap second event of December 31, 2008 and future leaps events. This configuration of XL-GPS system and GPS Receiver Module software is expected to begin shipping in December 2008.

Related Information:
IERS and Future Leap Second Notifications

The International Earth Rotation and Reference Systems Service (IERS) determines when leap seconds are to be introduced into the UTC time scale. The IERS issues Bulletin C every 6 months (January and July) which advises if a leap second will be introduced in the next following date (i.e. end of June 30 or December 31). The latest Bulletin C is available at: <http://hpiers.obspm.fr/iers/bul/bulc/bulletinc.dat>.

USNO Time Service

The U.S. Naval Observatory's time service can be accessed by telephone. The phone numbers are 719-567-6742 (Colorado Springs), 202-762-1069 or 202-762-1401. The time announced by USNO can be used to visually confirm the time displayed on the XL-GPS front panel is synchronous with UTC(USNO).

Contact Information

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