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FIELD SERVICE BULLETIN

FSB #: 098-50620-003

DATE: November 18, 2008

System: XLi Time and Frequency System with the GPS Receiver Option

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
1510-602	XLi Time and Frequency System (1U)	
1510-652	XLi Time and Frequency System (2U)	
87-8028-2	GPS Receiver Option Module	

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:

XLi Time and Frequency Systems (XLi) with GPS Receiver Option 87-8028-2 manufactured prior to August 11, 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 XLi units will be one second behind UTC until the day after the scheduled leap second takes place or the XLi is rebooted.

December 31, 2008 Leap Second Event

A leap second insertion is scheduled for December 31, 2008. Affected XLi 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 XLi clock being one second behind UTC.

XLi 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 XLi 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 GPS Option Module (87-8028-2) to the XLi CPU (87-8000).

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 XLi can be rebooted by cycling power or using the **F100 KILL command**. A reboot of the XLi will clear the time error and properly handle the leap second insertion when it is scheduled. *The XLi 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 April 2009. When available, a Product Change Notice (PCN) will be posted on www.symmetricon.com. This software update will insure proper handling of future leap second events without user intervention.

Factory Upgrade

A factory upgrade to the GPS Option Module 87-8028-2 and the XLi software to current versions will insure proper handling of future leap seconds events.

Additional Information:

XLi Software Versions and Leap Second Performance

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

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

F18: The XLi software version is identified with the last three characters following the PROJ REV # x-x. For example: PROJ REV #2-1 identifies XLi software version 2-1 is installed.

F119 Bn (n = bay number that the GPS receiver is installed in)

The GPS Option Module software version is identified in the last three digits of the number following SOFTWARE. For example: SOFTWARE 230-01510-04v1.20 identifies software version 1.20 is installed on the carrier card.

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

XLi Software Version (F18)	GPS Option Module Software (F119) Version 1.18	GPS Option Module Software (F119) Version 1.20
Version 2-0 or earlier	A one second error manifests in the XLi clock on October 1, 2008 at 00:00:00 UTC. Requires XLi system reboot (power cycle or F100 kill command) to restore synchronization to UTC. After reboot, the XLi will correctly handle the leap second insertion on December 31, 2008. <i>If no action is taken (i.e no reboot), the XLi clock will be one second behind UTC from Oct 1 through Jan 1. The XLi clock will resynchronize to UTC when the GPS system transmits the new leap second information on Jan 1. The XLi 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.</i>	A one second error manifests in the XLi clock on October 1, 2008 at 00:00:00 UTC. Requires XLi system reboot (power cycle or F100 kill command) to restore synchronization to UTC. After reboot, the XLi will correctly handle the leap second insertion on December 31, 2008. <i>If no action is taken (i.e no reboot), the XLi clock will be one second behind UTC from Oct 1 through Jan 1. The XLi clock will resynchronize to UTC when the GPS system transmits the new leap second information on Jan 1. The XLi 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.</i> A field upgrade to XLi software to project version 2-1 is currently available and recommended which insures synchronization to UTC before, during and after the leap second event of December 31, 2008 and future leaps events.
Version 2-1	A one second error manifests in the XLi clock on October 1, 2008 at 00:00:00 UTC. The XLi clock will be one second behind UTC for approximately 1 minute at which time it will resynchronize with UTC without any user action. <i>The scheduled leap second event on December 31, 2008 will be properly managed by the XLi.</i> The XLi 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.	Properly maintains the XLi clock and synchronization to UTC before, during and after the leap second event of December 31, 2008 and future leaps events. This configuration of XLi system and GPS Option Module software began shipping in August 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 XLI's front panel is synchronous with UTC(USNO).

Contact Information

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