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FIELD SERVICE BULLETIN

FSB #: 098-50620-005

DATE: December 03, 2008

System: XLi IEEE 1588 Grandmaster Clock

Issue: Potential one second time error during the 90 day period prior to a scheduled leap second event when operating in UTC mode.

Product Code:	Description:	CLEI Code: N/A
1510-702	XLi IEEE 1588 Grandmaster Clock	
1510-703	XLi IEEE 1588 Grandmaster Clock, 2 Port	

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 IEEE 1588 Grandmaster Clocks (XLi GM) operating in UTC time mode 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 GM units will be one second behind UTC until the day after the scheduled leap second takes place or the XLi GM is rebooted.

Note: The IEEE 1588 Version 1 standard specifies International Atomic Time (TAI) as the time scale for the precise time protocol. XLi GMs operating in the default TAI mode are not impacted by this leap second issue. Function command F69 queries and sets the XL GM time mode.

December 31, 2008 Leap Second Event

A leap second insertion is scheduled for December 31, 2008. Affected XLi GM units operating in UTC mode 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 GM clock being one second behind UTC.

XLi GM 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 GM 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 Receiver Module (87-8028-2) to the XLi GM 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 GM can be rebooted by cycling power or using the **F100 KILL command**. A reboot of the XLi GM will clear the time error and properly handle the leap second insertion when it is scheduled. *The XLi GM clock will maintain UTC synchronization up until 90 days before the next leap second is scheduled without any further user action.*

Additional Information:

XLi GM Software Versions and Leap Second Performance

The combination of XLi GM system and GPS Option Module software versions impact how leap seconds are managed by the XLi GM. The following information is provided to allow customers to determine the XLi GM and GPS Receiver Module software versions and respective leap second performance. Future software updates are not planned at this time.

To verify the installed XLi GM system and GPS Receiver Module software versions, use commands F18 and F119 (respectively), via Keypad, Telnet, or RS-232 port as described in the XLi GM User Guide:

<http://www.symmetric.com/products/ieee-1588-ptp-solutions/1588-measurement-validation/XLi-IEEE-1588-Grandmaster/>.

F18: The XLi GM software version is identified with the last three characters following the PROJ REV # x.xx.x. For example: PROJ REV #1.92.2.4 identifies XL-GPS software version 1.92.2.4.

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 GM clock performance per the combination of the XLi GM system and GPS Receiver Module software versions related to the scheduled leap second event of December 31, 2008.

XLi GM Software Version (F18)	GPS Receiver Module Software (F119) Version 1.18	GPS Receiver Module Software (F119) Version 1.20
Version 1.92.2.4	<p>When operating in UTC time mode, a one second error manifests in the XLi GM clock on October 1, 2008 at 00:00:00 UTC.</p> <p>Requires XLi GM system reboot (power cycle or F100 kill command) to restore synchronization to UTC. After reboot, the XLi GM will correctly handle the leap second insertion on December 31, 2008.</p> <p><i>If no action is taken (i.e no reboot), the XLi Gm clock will be one second behind UTC from Oct 1 through Jan 1. The XLi GM clock will resynchronize to UTC when the GPS system transmits the new leap second information on Jan 1. The XLi GM 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.</i></p>	<p>When operating in UTC time mode, a one second error manifests in the XLi GM clock on October 1, 2008 at 00:00:00 UTC.</p> <p>Requires XLi GM system reboot (power cycle or F100 kill command) to restore synchronization to UTC. After reboot, the XLi GM will correctly handle the leap second insertion on December 31, 2008.</p> <p><i>If no action is taken (i.e no reboot), the XLi GM clock will be one second behind UTC from Oct 1 through Jan 1. The XLi GM clock will resynchronize to UTC when the GPS system transmits the new leap second information on Jan 1. The XLi GM 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.</i></p>

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 GM front panel is synchronous with UTC(USNO) when it is operating in UTC mode.

Contact Information

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<http://www.symmetricom.com>