

ENGINEERING CHANGE NOTIFICATION FORM

ECN: 80200558	REV: 1	ISSUE DATE: 11/17/2017				
TYPE OF CHANGE: Firmware Modification						
DETAILED DESCRIPTION OF CHANGE: Firmware release 1.12 for Low Noise Rubidium GNSDO for bug fixes and functionality improvements in Galileo support, phase normalization improvements and holdover performance improvements.						
REASON FOR CHANGE: Bug fixes and functionality improvements.						
PRODUCTS AFFECTED: <table border="1" data-bbox="131 688 1459 762"> <thead> <tr> <th>Firmware Version</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>Firmware 0.36 and previous</td> <td>Low Noise Rubidium GNSDO</td> </tr> </tbody> </table>			Firmware Version	Model	Firmware 0.36 and previous	Low Noise Rubidium GNSDO
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Notes:						
AVAILABILITY: <table border="1" data-bbox="131 823 1459 888"> <thead> <tr> <th>MILESTONE</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>ECN release for firmware release files</td> <td>11/17/2017</td> </tr> </tbody> </table>			MILESTONE	DATE	ECN release for firmware release files	11/17/2017
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<p>Release 1.12 for the Low Noise Rubidium GNSDO provides the following improvements:</p> <p>Issue 1:</p> <p>uBlox receivers modified the GPS version command so it could no longer be read by the Low Noise Rubidium GNSDO. Units already in the field are not affected since this v1.12 is applied at the factory to units requiring the update.</p> <p>Resolution:</p> <p>Firmware 1.12 modifies the GPS message handling to support the modified GPS version command.</p> <p>Issue 2:</p> <p>uBlox receivers added support for Galileo but the GPS:SYST:SEL command in previous firmware versions did not support Galileo.</p> <p>Resolution:</p> <p>GPS:SYST:SEL command modified to support Galileo. Galileo is enabled with the GPS:SYST:SEL GAL command. The complete syntax of this command is:</p> <p style="padding-left: 40px;">GPS:SYSTEM:SElect <GPS SBAS QZSS GAL BD ^ GLO></p> <p>Issue 3:</p> <p>The Low Noise Rubidium GNSDO frequency phase stability during holdover depends greatly on the selection of holdover steering algorithm. Previous firmware releases did not take advantage of the long-term frequency stability of the Rubidium oscillator when calculating the holdover steering.</p> <p>Resolution:</p> <p>Version 1.12 adds an improved holdover steering algorithm that models the long-term rubidium oscillator behavior. The holdover steering algorithm also improves the transition from the short-term steering value to the long-term holdover</p>						

steering to avoid negatively affecting short-term holdover performance.

Issue 4:

During a phase normalization the 1PPS output should be adjusted as close as possible to the reference 1PPS input while maintaining alignment with the 10MHz output clock (i.e.±50 ns). With previous firmware releases and under some conditions, this phase offset after a normalization could be greater than 50 ns. This additional phase offset is removed by the disciplining algorithms, but starting with a higher offset results in a longer phase stabilization time.

Resolution:

Version 1.12 improves the phase normalization routine so that the initial phase offset is within approximately ±50 ns.

REFERENCE DOCUMENTS/ATTACHMENTS:

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