

GNSS UPDATES

FOR MATRIX GS & AEROS CONSOLES – APRIL, 2015

Release Notes for v4.11 detail a number of new features and configuration options available in the Q2, 2015 v4.11 software release for TeeJet Matrix GS and Aeros consoles. This document offers more detail on several of the options new to v4.11 that are specifically related to the GNSS receiver and positioning performance. Testing in recent months has determined that these options can significantly improve GNSS positioning accuracy when operating in difficult reception environments including northern latitudes, and in proximity to trees, buildings, etc.

New GLONASS Option

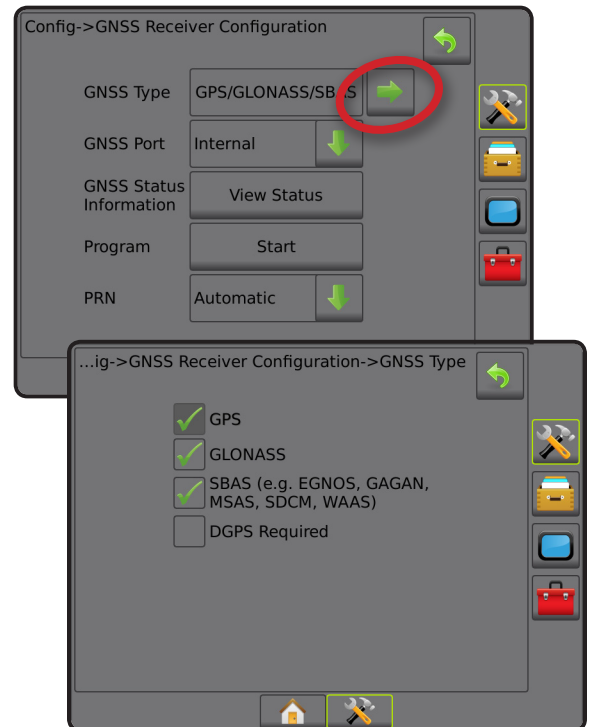
v4.11 introduces a new GNSS Configuration menu that now allows the selection of GPS + GLONASS + SBAS (EGNOS, WAAS, MSAS, GAGAN) when using the internal GNSS receiver. When GPS + GLONASS + SBAS is selected, and the unit is operating under a supported SBAS system, the receiver will apply SBAS corrections to the 8 best GPS observations available, and in addition will include up to 4 of the best GLONASS observations in the solution. Correction data for GLONASS observations is currently not provided by any of the fully operational SBAS systems in the world, so the GLONASS observations are included in the solution at a lesser weighting than the SBAS-corrected GPS observations. The receiver will always use the maximum number of valid GPS and GLONASS observations that are in view, up to a total of 12 (8 + 4).

This combination is only available if all of the following criteria are met:

- a. Console must be running software v4.11
- b. The GNSS receiver must be running v010201 or later.
See “Tech Support->Software/Firmware Updates->Matrix Pro ClearPath Receiver Update” for more details on updating to v010201.
NOTE: Many Type 6 and Type 7 receivers are already running v010201 in which case no receiver update is required. Please see the instructions at the above url for directions on how to check the GNSS receiver version.
- c. The GNSS receiver must be updated to the GLONASS enabled ‘Receiver 7’. ‘Receiver 6’ units can be updated to the ‘Receiver 7’ configuration at no cost by following the instructions at “Tech Support->Software/Firmware Updates->GLONASS Enable”.
NOTE: L1-only Aeros consoles already use a Receiver 7 GNSS receiver and a GLONASS capable GNSS antenna.
- d. The GNSS antenna must be GLONASS capable. TeeJet’s optional RXA-30 antenna is already GLONASS capable, but most Patch antennas sold with Matrix Pro GS consoles equipped with Receiver 6 GNSS receivers are GPS only, and will have to be replaced with GLONASS capable antennas in order to receive and apply GLONASS observations. Options include the RXA-30 antenna mentioned above (part number 90-02720), and the GLONASS patch antenna (part number 78-50190).

NOTE: The cost for antenna replacement is not covered by TeeJet Technologies.

NOTE: When set to GPS, or GPS + SBAS, the receiver uses up to 12 GPS observations. When set to GPS + GLO (no SBAS), the receiver uses up to 8 GPS observations, and up to 6 GLONASS observations.



RXA-30

ClearPath Filter Reset Option

Poor GNSS reception due to interference from trees and buildings while road-transporting to the field can result in positioning errors accumulating in the ClearPath filter that runs in the GNSS receiver. These degraded positions may still negatively affect accuracy if application begins soon after reaching the field. Although this error steadily declines over 15-30 minutes of clear-sky operation, a job that starts with the degraded positions has a high likelihood of overlaps or skips occurring as the position accuracy improves during the job.

Resetting the ClearPath filter at the start of the job once the machine is in the field with a clear view of the sky means there is no accumulated position error at the start of the job, and therefore the chances of skips and overlaps is significantly reduced later in the job.

v4.11 supports the ability to reset the ClearPath filter, thereby purging the position errors. The ClearPath filter reset feature can be turned on with a USB Drive app, which can be downloaded from "Tech Support->Software/Firmware Updates->Matrix Pro GS ClearPath Filter Reset". Once the ClearPath filter reset feature is turned on with the USB Drive app, the user resets the filter simply by opening the job once the machine is in the field with a clear view of the sky. The filter can be reset at any time by closing the job and reopening it again.

NOTE 1: The Matrix Pro GS console software must be updated to v4.11 before enabling the ClearPath filter reset feature.

NOTE 2: The console must be operated in Advanced Job Mode (not Simple Mode) in order for the ClearPath filter reset feature to be active.

Summary

Maximum GNSS performance can be achieved with Matrix GS and Aeros consoles by:

1. Upgrading the console software to v4.11	Tech Support->Software/Firmware Updates->Matrix Pro GS v4.11 Software Upgrade
2. Upgrading the GNSS receiver to v010201	Tech Support->Software/Firmware Updates->Matrix Pro ClearPath Receiver Update
3. Upgrade from Receiver 6 to Receiver 7 *	Tech Support->Software/Firmware Updates->GLONASS Enable
4. Turning on the ClearPath filter reset feature **	Tech Support->Software/Firmware Updates->Matrix Pro GS ClearPath Filter Reset
5. If operating in an area covered by SBAS (EGNOS, GAGAN, MSAS, WAAS) and with trees or buildings in close proximity, use the new GNSS configuration GPS + GLO + SBAS for improved positioning reliability	

* Receiver must be updated to v010201 before upgrading from Receiver 6 to Receiver 7

** Console must be updated to v4.11 before turning on the ClearPath filter reset feature



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