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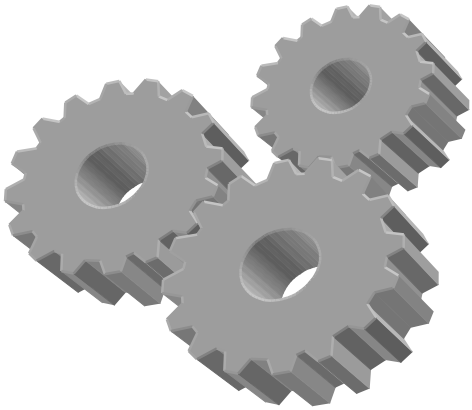


Oregon Real-Time GNSS Network: GLONASS Products

Revision Date 20-Jan-2016

Introduction

The Oregon Real-Time GNSS Network (ORGN), operated by the Oregon Department of Transportation's Geometronics Unit in cooperation with many partners, now has limited **GPS+GLONASS** (**GG**) coverage statewide.

The ORGN is a cooperative network that consists of approximately 100 reference stations: many of these sites are now GG-enabled. We are currently working on a plan to enable GLONASS on all ORGN sites.

To view a current list of the ORGN GG-enabled sites, please view our ORGN web page, www.theorgn.net, and click on **GLONASS**.

You may also use the ODOT Geometronics Online Toolkit, https://gis.odot.state.or.us/geometronicsonlinetoolkit/ to view which ORGN sites are GG-enabled. See details below on using the Online Toolkit.

All of the GG-enabled ORGN sites now produce RINEX files for post-processing that contain both GPS and GLONASS data.

The GG-enabled sites are also available for single base real-time correctors from the ORGN as described below.

The ORGN MAX and iMAX multi-base correctors (also known as "network correctors"), are available in some situations as described below.

1. Named Single-base GG Correctors: You can select a GG single-base corrector by site name from the ORGN mount point list (source table) of **Port 9879** (see "**Summary of ORGN Correctors and Ports**" below).

2. Nearest single-base GG correctors are available from **Port 9882**.

3. Network (Multi-base) GG Correctors from **Port 9882**: If you are using our MAX or i-MAX network (multi-base) GG corrector from **Port 9882**, you will receive a GG corrector if, and only if, the master station used in your corrector is GG-enabled. The master station for our MAX and i_MAX correctors is automatically chosen by the ORGN Leica GNSS Spider operating software: this master station chosen by Spider will normally be the ORGN reference station that is nearest to your rover; therefore, if the nearest operating healthy ORGN site to your rover is GG-enabled and selected by Spider as the master station, **you will** receive a GG corrector.

4. Note: We recommend that you only use our GG real-time correctors if your rover is GPS+GLONASS capable; otherwise, we recommend you use the GPS-only correctors located on **Port 9879** and **Port 9881**.

Summary of ORGN Real-time Correctors and Ports

We have created new ORGN GG real-time correctors and we have also changed the port numbers of some real-time correctors that you may already be using, so you may need to reconfigure your rover to use the ORGN real-time correctors of your choice. The following is a summary of the real-time correctors available from the ORGN and which port they are located on.

Our IP address for all ORGN real-time correctors is the same: **167.131.109.57**

Port 9879: (This port has both GPS-only and GG single base correctors.)

-All single-base correctors by name: both GPS-only and GG.

-The desired corrector is selected by the user from the mount point list (*source table)* on Port 9879.

-GPS-only correctors in the source table are named with the four character site ID and the appendage **"_*Single*"**, for example, **RSBG_Single**. These single-base GPS-only correctors are all in the RTCM2.3 format.

-GG correctors in the source table are named with the four character site ID and the appendage "***_Single_GG3x***", for example, **RSBG_Single_GG3x.** These single-base GG correctors are all in the RTCM3x format.

Port 9881: **All correctors** on this port are **GPS-only** correctors.

-Network (multi-base) & Nearest-single-base correctors: **all are GPS-only**.

-Available mount points on the source table:

-"**Nearest_Single_RTCM23**" (for older rovers not RTCM3 capable)
-"**Nearest_Single_RTCM3**" (for newer RTCM3 capable rovers)
-"**MAX_RTCM3**" (network multi-base corrector: RTCM3x format)
-"**IMAX_RTCM23**" (network multi-base corrector: RTCM2.3 format)
-"**IMAX_CMR+**" (for precision agriculture users)
-"**IMAX_CMR_AG**" (for precision agriculture users)

-The user selects the desired corrector from the mount point list (source table) and then the ORGN automatically selects the best master reference station for MAX and i-MAX correctors, or the nearest reference station for a Nearest-Single corrector.

-**Important**: Spider automatically selects the optimal base station based on your rover location, so if using the MAX, i-MAX or Nearest-single corrector, your rover **must** be

configured to send its location to the ORGN by enabling the "send GGA" NMEA message output on your rover.

Port 9882: **All correctors** on this port are **GG** correctors.

- Network (multi-base) & Nearest-single-base correctors: **all GG**
-Available mount points on the source table:

-"**Nearest_Single_GG_RTCM3**"
-"**MAX_GG_RTCM3**" (network multi-base corrector: RTCM3x format)
-"**IMAX_GG_RTCM3**" (network multi-base corrector: RTCM3x format)
-"**IMAX_GG_CMR**" (for precision ag users)
-"**IMAX_GG_CMR_AG**" (for precision ag users)

- The user selects the desired corrector from the mount point list (source table) and then the ORGN Spider automatically selects the best master reference station for MAX and i-MAX correctors, or the nearest reference station for a Nearest-Single corrector.

-**Important**: Spider automatically selects the optimal base station based on your rover location, so if using the MAX, i-MAX or Nearest-single corrector, your rover **must** be configured to send its location to the ORGN by enabling the "send GGA" NMEA message output on your rover.

Important: The nearest_single base and the named_single base real-time correctors are both based upon a single GNSS baseline between your rover and a single ORGN reference station; therefore, the nearest_single and named_single correctors are subject to the same distant dependent errors of any single baseline real-time GNSS corrector. This distant dependent error is typically specified as 1 ppm by GNSS manufacturers, which translates to 1 cm of additional error for each kilometer of baseline length. DO NOT use a single base real-time corrector for longer baselines than prudent to maintain your project error budget.

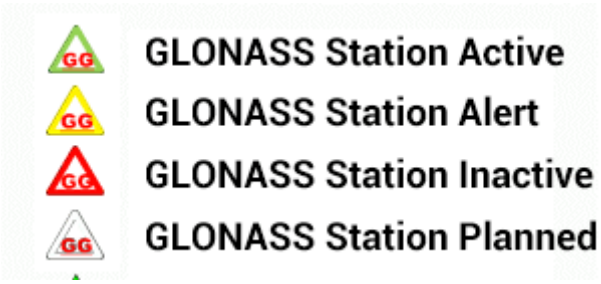
Both the MAX and i_MAX real-time correctors are *true network (multi-base station) real-time correctors* based upon a *cell of several ORGN reference stations. As opposed to a single baseline corrector*, these network (multi-base) correctors minimize distant dependent GNSS errors to a negligible amount. Most rover users will choose to use the MAX or i_MAX real-time correctors to take advantage of their minimization of distant dependent errors.

ODOT Geometronics Online Toolkit

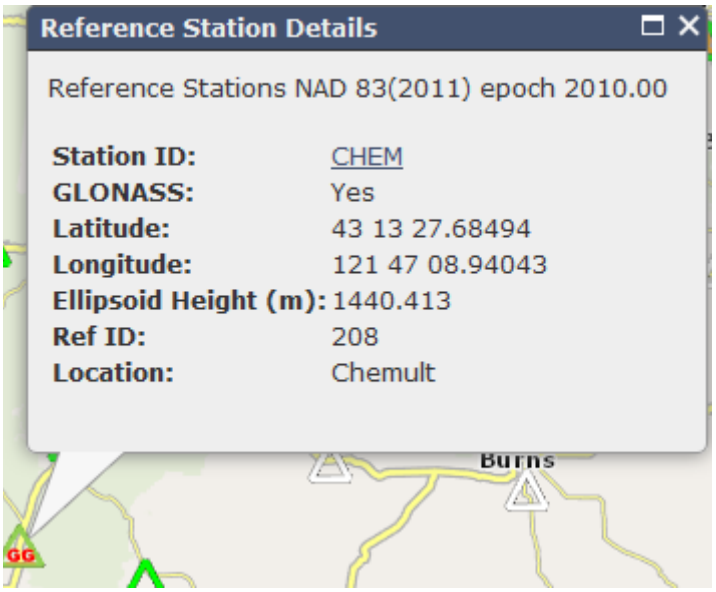
In addition to using our ORGN web page, www.theorgn.net, and clicking on **GLONASS** to view which ORGN sites are GG-enabled, you can also view the ORGN GG-enabled sites by using our GIS-based ODOT Geometronics Online Toolkit at:
https://gis.odot.state.or.us/geometronicsonlinetoolkit/

Click on the "*ORGN Tools*" tab, then click on "*ORGN*" in the pull-down menu that appears.

Click on "*Show Sites*" to display all ORGN sites. The GG-enabled sites have one of the following icons with a GG within a triangle:



Click on the "*Station ID Tool*" and hover your mouse over an ORGN site icon on the map to display a pop-up "*Reference Station Details*" window. All GG-enabled sites show "GLONASS: Yes" in this window:



Another method to view GG-enabled ORGN sites within the Geometronics Online Toolkit is to click on the "*Show Stations List"* to display a list of all ORGN sites. The GG-enabled sites are marked "Yes" in the GLONASS column.

This station list of ORGN stations also displays the NAD83 (2011) epoch 2010.00 coordinates, the Reference ID number, and a hyperlink to the webpage of each site. Many models of GNSS rovers display the site Reference ID number of the site you are using for an ORGN real-time corrector. This station list can be downloaded by clicking "*Export to Excel*".

Summary

The ORGN now has GLONASS capability as described above and we are working to provide GLONASS capability on all ORGN reference stations. We will keep ORGN users updated on our progress.

Please visit our ORGN website at www.TheORGN.net for more information about the Oregon Real-time GNSS Network, including network status, products and services, support information, and contacts.