

# iG3s vs. iG8 Static Performance: Moderate Canopy

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By: Mark Silver, [ms@igage.com](mailto:ms@igage.com), +1-801-412-0011 x16

## Description

A test is performed comparing an iG3s receiver to an iG8 receiver for static performance in moderate canopy.

Two receivers:

iG8 SN 1021698 GNSS FW: 5.21 (BD970)

iG3s SN 953191 GNSS FW: B17542M

were placed at the North Center location of our parking lot on a tripod at random height and roughly leveled.



Location description: 1 story building 1 meter north, 2 story building 9 meters west, 1 story building 9 meters east. Buildings and trees along horizon from south west to south east. Power/utility lines run east-west midway through the parking lot. We consider this “moderate canopy” representative of a poor receiver location.

## Static Processing

Observation files were collected for approximately 4-hours and submitted to NGS OPUS Static for processing with no station overrides.



The solution result position-panels for each receiver is summarized below:

iG3s				iG8			
OBS USED:	8928 / 10050	:	89%	OBS USED:	8955 / 9822	:	91%
# FIXED AMB:	63 / 74	:	85%	# FIXED AMB:	54 / 64	:	84%
OVERALL RMS:	0.019 (m)			OVERALL RMS:	0.023 (m)		
REF FRAME:	NAD_83(2011) (EPOCH:2010.0000)			REF FRAME:	NAD_83(2011) (EPOCH:2010.0000)		
LAT:	40 44 10.36684		0.002 (m)	LAT:	40 44 10.36752		0.005 (m)
E LON:	248 8 27.05147		0.014 (m)	E LON:	248 8 27.05953		0.011 (m)
W LON:	111 51 32.94853		0.014 (m)	W LON:	111 51 32.94047		0.011 (m)
EL HGT:	1304.372 (m)		0.006 (m)	EL HGT:	1304.285 (m)		0.010 (m)



The Observations Used and Fixed Ambiguities are acceptable for this location and nearly identical for both receivers.

Using the 4-hour files processed using OPUS-Static the iG3s has a slightly smaller Overall RMS spread which is mirrored in the Ellipsoid Height peak-to-peak results.

### Rapid-Static Processing

Each receiver's 4-hour observation file was decimated into 4 (approximately) 1-hour files and submitted to OPUS-RS with these tabulated results:

	A	C	D	E	F	K	L	M	N	O	P	AF	AG
<b>iG3s</b>													
1	StartTime	DeltaTir	RINEX_FH	OverAll_RMS	OBS_Used	LAT1	LAT1_RMS	LON1	LON1_RMS	EL1_HGT	EL1_RMS	Ephemeris	BaseStations
2	1/30/2018 18:10	0:49:00	ig31030s.	0.306	86%	40.73621309	0.009	111.85915236	0.005	1304.429	0.020	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
3	1/30/2018 19:00	0:59:30	ig31030t.	0.301	93%	40.73621303	0.006	111.85915223	0.006	1304.406	0.031	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
4	1/30/2018 20:00	0:59:30	ig31030u.	0.317	83%	40.73621303	0.006	111.85915242	0.007	1304.375	0.029	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
5	1/30/2018 21:00	0:59:30	ig31030v.	0.365	96%	40.73621297	0.009	111.85915242	0.005	1304.334	0.022	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
6													
7	Min			0.301		40.73621297	0.006	111.85915223	0.005	1304.334	0.020		
8	Max			0.365		40.73621309	0.009	111.85915242	0.007	1304.429	0.031		
9	Rng			0.064		0.00000012	0.003	0.00000019	0.002	0.095	0.011		
10	Avg			0.322	89.5%	40.73621303	0.008	111.85915236	0.006	1304.386	0.026		
11	StdDev			0.029		0.00000005	0.002	0.00000009	0.001	0.041	0.005		
12	DMS					40 44 10.366908		111 51 32.948487					
13	Velocity (m/yr)									-293.258			
14													
15													
16													
<b>iG8</b>													
17	StartTime	DeltaTir	RINEX_FH	OverAll_RMS	OBS_Used	LAT1	LAT1_RMS	LON1	LON1_RMS	EL1_HGT	EL1_RMS	Ephemeris	BaseStations
18	1/30/2018 18:11	0:48:30	ig81030s.	0.330	77%	40.73621328	0.010	111.85915015	0.006	1304.375	0.017	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
19	1/30/2018 19:00	0:59:30	ig81030t.	0.308	95%	40.73621329	0.006	111.85915001	0.006	1304.329	0.026	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
20	1/30/2018 20:00	0:59:30	ig81030u.	0.338	83%	40.73621327	0.006	111.85915021	0.006	1304.37	0.039	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
21	1/30/2018 21:00	0:59:30	ig81030v.	0.361	97%	40.73621320	0.008	111.85915016	0.003	1304.241	0.017	rapid	AHID,GOSH,P030,P057,P100,P105,P113,P122,PUC2
22													
23	Min			0.308		40.73621320	0.006	111.85915001	0.003	1304.241	0.017		
24	Max			0.361		40.73621329	0.010	111.85915021	0.006	1304.375	0.039		
25	Rng			0.053		0.00000009	0.004	0.00000020	0.003	0.134	0.022		
26	Avg			0.334	88.0%	40.73621326	0.008	111.85915013	0.005	1304.3288	0.025		
27	StdDev			0.022		0.00000004	0.002	0.00000009	0.002	0.062	0.010		
28	DMS					40 44 10.367735		111 51 32.940480					
29	Velocity (m/yr)									-336.9529			
30													

Again, the two receivers are nearly identical in peak-to-peak ranges for Lat, Lon and Height.

The iG3s has slightly better range (0.095 vs. 0.134 M) Ellipsoid Elevation spread and slightly better Overall RMS.



## Conclusion

The iG3s and iG8 are nearly identical in performance when used in the same location, at the same time when processed by NGS OPUS Static and OPUS Rapid-Static.

Based on our testing experience they should be considered to be statistically equivalent receivers for data sets collected in locations with similar limited sky visibility.

## Data Availability

All of the raw data, decimated raw data, OPUS results, summary data and final results are available in a single ZIP file in this web folder:

[https://ig3s.com/out/SampleObsFiles/iG3s\\_vs\\_iG8\\_Static/index.html](https://ig3s.com/out/SampleObsFiles/iG3s_vs_iG8_Static/index.html)