

Comparison of Network/Local Accuracies on GPS Network in Wisconsin

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Notes:

1. All units are meters. The number of significant figures listed cannot be justified except to show where differences occur.
2. Results are based upon RINEX data from 9 CORS stations as described at: www.globalcogo.com/StdDevLocalNetwork.pdf
3. Baselines were computed using Trimble, Thales, and Topcon baseline processing software and NGS precise ephemerides.
4. Least squares network adjustment software is matrix based as shown at: www.globalcogo.com/LS-algorithm.pdf
5. Network was adjusted using WisDOT values for control stations FOLA & KEHA. Different tolerances for control are as listed.
6. A BURKORD™ file was generated from the adjustment results - Stations, X/Y/Z coordinates, & adjustment covariance matrix.
7. Network/local accuracies were computed from BURKORD™ data file as shown at: www.globalcogo.com/BK-file.pdf
8. Different software brands show similar trends, but procedures for computing baseline covariances are not "standard."
9. Four bi-directional cases are shown for each software brand - 2 stations directly connected and 2 not directly connected.
10. Comparison is between GSDM results and Soler/Smith (S/S) results. Validity of GSDM results is proven elsewhere.
11. Complete project documentation can be viewed at www.globalcogo.com/NetLocal-comparison.html

Software	Sta to Sta (Bi-directional)	Accuracies	Control at 0.002 m		Control at 0.010 m		Control at 1.00 m		Control at 5.00 m	
			GSDM	S/S	GSDM	S/S	GSDM	S/S	GSDM	S/S
Trimble	FRSI-RASN (medium)	Network	0.00427	0.00427	0.01494	0.01494	1.66535	1.66535	7.32058	7.32058
		Local	0.00182	0.00182	0.00178	0.00178	0.00200	0.00491	0.00180	0.01979
	RASN-FRSI (22 km)	Network	0.00427	0.00427	0.01494	0.01494	1.66534	1.66534	7.32053	7.32053
		Local	0.00182	0.00182	0.00178	0.00178	0.00201	0.00491	0.00180	0.01979
	FRSI-SHAN (long)	Network	0.00428	0.00429	0.01496	0.01497	1.66530	1.66530	7.32033	7.32033
		Local	0.00247	0.00249	0.00250	0.00253	0.00285	0.01900	0.00251	0.08261
	SHAN-FRSI (100 km)	Network	0.00432	0.00429	0.01497	0.01497	1.66531	1.66531	7.32038	7.32038
		Local	0.00250	0.00249	0.00253	0.00253	0.00288	0.01900	0.00254	0.08261
	PARO-KEHA (Medium)	Network	0.00384	0.00384	0.01496	0.01496	1.66533	1.66533	7.32047	7.32047
		Local	0.00251	0.00251	0.00276	0.00275	0.00320	0.01561	0.00282	0.06723
	KEHA-PARO (65 km)	Network	0.00384	0.00384	0.01486	0.01486	1.66533	1.66533	7.32050	7.32050
		Local	0.00250	0.00251	0.00274	0.00276	0.00316	0.01561	0.00279	0.06723
	PARO-SHAN (long)	Network	0.00418	0.00418	0.01492	0.01493	1.66527	1.66527	7.32021	7.32021
		Local	0.00243	0.00244	0.00241	0.00244	0.00275	0.02532	0.00242	0.11066
	SHAN-PARO (119 km)	Network	0.00422	0.00419	0.01494	0.01493	1.66529	1.66529	7.32030	7.32030
		Local	0.00247	0.00244	0.00245	0.00243	0.00279	0.02532	0.00246	0.11066

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Software	Sta to Sta	Accuracies	Control at 0.002 m		Control at 0.010 m		Control at 1.00 m		Control at 5.00 m	
Thales			GSDM	S/S	GSDM	S/S	GSDM	S/S	GSDM	S/S
directly connected	FRSI-RASN (medium)	Network	0.00776	0.00776	0.00795	0.00795	0.15369	0.15369	0.76745	0.76745
		Local	0.00268	0.00268	0.00265	0.00265	0.00252	0.00255	0.00252	0.00325
	RASN-FRSI	Network	0.00776	0.00776	0.00795	0.00795	0.15369	0.15369	0.76744	0.76744
		Local	0.00268	0.00268	0.00265	0.00265	0.00251	0.00255	0.00251	0.00325
directly connected	FRSI-SHAN (long)	Network	0.00972	0.00971	0.00989	0.00988	0.15379	0.15379	0.76744	0.76744
		Local	0.00811	0.00810	0.00816	0.00816	0.00832	0.00849	0.00832	0.01200
	SHAN-FRSI	Network	0.00971	0.00972	0.00988	0.00989	0.15379	0.15379	0.76745	0.76745
		Local	0.00810	0.00811	0.00815	0.00816	0.00831	0.00849	0.00831	0.01200
not directly connected	PARO-KEHA (Medium)	Network	0.00665	0.00665	0.00695	0.00695	0.15374	0.15374	0.76745	0.76745
		Local	0.00664	0.00664	0.00671	0.00671	0.00764	0.00778	0.00764	0.01039
	KEHA-PARO	Network	0.00664	0.00663	0.00695	0.00694	0.15374	0.15374	0.76745	0.76745
		Local	0.00663	0.00662	0.00670	0.00669	0.00763	0.00776	0.00764	0.01038
not directly connected	PARO-SHAN (long)	Network	0.01086	0.01083	0.01101	0.01099	0.15386	0.15386	0.76744	0.76744
		Local	0.00920	0.00917	0.00923	0.00921	0.00918	0.00945	0.00918	0.01478
	SHAN-PARO	Network	0.01084	0.01086	0.01100	0.01101	0.15386	0.15386	0.76745	0.76745
		Local	0.00918	0.00919	0.00922	0.00923	0.00916	0.00946	0.00916	0.01479
Software	Sta to Sta	Accuracies	Control at 0.002 m		Control at 0.010 m		Control at 1.00 m		Control at 5.00 m	
Topcon			GSDM	S/S	GSDM	S/S	GSDM	S/S	GSDM	S/S
directly connected	FRSI-RASN (medium)	Network	0.00518	0.00518	0.00665	0.00665	0.33529	0.33529	1.67606	1.67606
		Local	0.00250	0.00250	0.00222	0.00222	0.00154	0.00179	0.00155	0.00477
	RASN-FRSI	Network	0.00518	0.00517	0.00665	0.00665	0.33529	0.33529	1.67605	1.67605
		Local	0.00250	0.00250	0.00222	0.00222	0.00154	0.00179	0.00155	0.00477
directly connected	FRSI-SHAN (long)	Network	0.00697	0.00697	0.00786	0.00786	0.33529	0.33529	1.67600	1.67600
		Local	0.00588	0.00588	0.00546	0.00546	0.00398	0.00549	0.00398	0.01932
	SHAN-FRSI	Network	0.00698	0.00697	0.00787	0.00787	0.33529	0.33529	1.67601	1.67601
		Local	0.00589	0.00588	0.00546	0.00546	0.00398	0.00549	0.00398	0.01932
not directly connected	PARO-KEHA (Medium)	Network	0.00420	0.00420	0.00640	0.00640	0.33528	0.33528	1.67603	1.67603
		Local	0.00402	0.00402	0.00389	0.00389	0.00286	0.00420	0.00286	0.01564
	KEHA-PARO	Network	0.00421	0.00420	0.00641	0.00640	0.33529	0.33529	1.67604	1.67604
		Local	0.00402	0.00402	0.00389	0.00389	0.00286	0.00420	0.00286	0.01564
not directly connected	PARO-SHAN (long)	Network	0.00754	0.00754	0.00824	0.00824	0.33529	0.33529	1.67598	1.67598
		Local	0.00652	0.00652	0.00588	0.00588	0.00417	0.00656	0.00417	0.02567
	SHAN-PARO	Network	0.00756	0.00854	0.00825	0.00824	0.33529	0.33529	1.67600	1.67600
		Local	0.00653	0.00652	0.00289	0.00588	0.00418	0.00656	0.00418	0.02567

