

Chapter 4

SBF Converter



4.1 Introduction

SBF Converter is a conversion utility which allows users to convert SBF logged files of the Septentrio Receiver to other formats such as RINEX, ASCII, GPX and KML. The commands, if logged in a file, can also be converted to a readable text format. Once SBF Converter 15.0.0 is installed, it can be launched by clicking the SBF Converter short-cut icon created by the installation program. Please consult the HTML help pages of SBF Converter 15.0.0 for more information on this program.

4.1.1 SBF Converter compatibility

SBF Converter 15.0.0 can convert data logged using any Septentrio Receiver however, some older SBF blocks particular to the PolaRx2/2e may not be fully compatible with SBF Converter.

4.1.2 Launching SBF Converter

SBF Converter can be launched in several ways: using the RxLauncher GUI, from the Start menu on a Window's PC, a shortcut to the SBF Converter executable can be found under



'Septentrio RxTools'. You can also launch SBF Converter via the 'Tools' menu of any of the GUI tools, for example from RxControl as shown in Figure 4-2. Users who prefer to use the command line are advised to use the SBF Tools and are directed to Section 11 on page 164 for more information.



Figure 4-2: Launching the SBF Converter GUI

4.2 Using SBF Converter: a worked example

4.2.1 Conversion to RINEX

SBF files can be opened in SBF Converter by clicking on either the folder icon next to the *Single file* field or the *Choose file* button next to the *Multiple files* field as Figure 4-3 shows.

SBF Converter						
SRF fle(s) sectors Srgle fle Single fle Multiple files Crosse fles Time window	Choose a file					
Exclude blocks with invalid time (except for RINEX) Epoch interval 1.00s ©	Organize • New folde	n 🕨 DATA 🕨		• + Search DAT	¥ Ⅲ ▼ 🛄	م 9
Isprore date for time window First epoch 01/12/2006 * Last epoch 01/12/2006 * Last epoch 01/12/2006 *	Libraries Documents Music Pictures	AF020710.13	Date modified 13/03/2013 15:48 13/03/2013 03:38	Type Septentrio Binary Septentrio Binary	Size 7,689 KB 468,714 KB	* E
Convert to RNEX Options ACIL (bin2ac) Options ACIL (bin2ac) Options SSE Block Options SSE Block Options	Videos Sarah Dean Config dia RxControl Septentrio	 tett.sbf log_ls.bf/sbf pp_log_testPPSDK.sbf log_0000.sbf log_23sf 	11,/03/2013 12:47 07/03/2013 11:36 24/02/2013 22:52 24/02/2013 22:50 19/02/2013 11:46 31/12/2012 16:36	Septentrio Binary Septentrio Binary Septentrio Binary Septentrio Binary Septentrio Binary	4,938 KB 19 KB 105 KB 236 KB 4 KB 14 KB	
Convert	AppData	 e log1.sbf test_1_0002.sbf test_1_0001.sbf test_1_0001.sbf Af020710.13_ 	31/12/2012 16:04 14/11/2012 17:46 14/11/2012 17:43	Septentrio Binary Septentrio Binary Septentrio Rinary S&F files (*.sb Open	22 KB 15,951 KB 102 400 KR (*.??_) Cance	•

Figure 4-3: Opening a file with SBF Converter

The sequence of screenshots in Figure 4-4 on the following page show the steps involved in configuring SBF Converter to convert SBF data to the RINEX format.





Figure 4-4: Configurations for RINEX conversion

Having made the configuration for RINEX conversion, you can then click on the *Convert* button which will produce a RINEX file similar to the example shown in Figure 4-5 on the next page.



🔀 C:\Us	ers\dean\DATA\AF020	710.obs - Notepac	<u>++</u>						
File Ed	lit Search View Er	ncoding Langua	ge Setti	ings Macro I	Run Tex	tFX Pluc	ins Window	?	X
i 🔓 占) 🗄 🖻 🗟 🕞 🖨	🎸 🗅 💼 2	p c	n 🎍 🔍 🔍	z 🖪	3 🗐	1 🎼 🐷	• • • • •	2 4 V 2 »
AF02	20710.obs								
1	2,11	OBSERV	ATTON	א בדבת			RINEX	VERSION / TYPE	
2	shf2rin-8.5.3	ODDERVI	AIION	14-	MAR-13	15:30	PGM /	RUN BY / DATE	
3	AF02					10.00	MARKE	R NAME	
4	SN2001404						MARKE	R NUMBER	
	cors be01	Senten	trio				OBSER	VFR / AGENCY	
6	2001404	SEPT S	SRC2	2 5	1		REC #	/ TYPE / VERS	
7	Unknown	AERAT1	675 12	O SPKE	••		ANT #	/ TYPE	
8	4021466.5090	332871.33	72 49	23001.3111			APPRO	X POSITION XYZ	
9	0.0000	0.00	00	0.0000			ANTEN	NA: DELTA H/E/N	
10	1 1						WAVEL	ENGTH FACT L1/2	
11	10 C1	L1 L2	P2	P1 C2	D1	D2	S1# / T	YPES OF OBSERV	
12	52						# / T	YPES OF OBSERV	
13	1.000						INTER	VAL	
14	2013 3	12 0	0	0.0000000	G	PS	TIME	OF FIRST OBS	
15	2013 3	12 23	59	59.0000000	G	PS	TIME	OF LAST OBS	
16	63						# OF	SATELLITES	
17							END O	F HEADER	
18	13 3 12 0 0	0.0000000	0 19	524520G0652	6R21G2	9G27R04	G21R10G16	G25	
19			(G31R19G30R1	1R20G0	5R12			
20	38035974.228	7 199880138	.54107						
21		2097	.743 7				42.250		
22	38542352.393	6 202541548	.01706						
23		2357	.815 6				40.250		
24	23656336.918	6 124314890	.19506	96868759.	12803	236563	37.792 3	23656336.552 3	
25		5502	.816 6	4287.	904 3		41.000	22.250	
26	38492942.699	6 202280757	.18606						
27		2293	.341 6				38.500		
28	20090663.678	8 107509222	.84408	83618295.	59107				
29	20090663.930	7 4427	.365 8	3443.	530 7		52.250	42.500	
30	21174347.258	8 111271995	.08408	86705472.	37406	211743	46.435 6	21174347.156 6	
31	21174346.386	7 256	.133 8	199.	584 6		50.500	41.750	
32	20247636.577	9 106402071	.21309	82910734.	22608	202476	34.631 8	20247636.603 8	
33	20247634.805	8 2877	.973 9	2242.	579 8		54.500	48.250	
34	22679364.893	7 121446975	.02907	94458770.	34106				
35	22679363.497	6 3506	.327 7	2727.	171 6		44.250	41.750	-
Norn 307	62472 chars 31668760	bytes 453145 line	s Ln:1	Col:81 Sel:	0 (0 bytes) in 0 rang	es	Dos\Windows ANSI	INS

Figure 4-5: Example of a RINEX file

Note that, in order to generate RINEX files, the SBF file must contain the relevant data for RINEX. The necessary blocks are selected automatically when checking the *Rinex* box in the *SBF* tab of either RxControl logger or RxLogger as shown in Figure 6-6 on page 128. If the SBF file does not contain the necessary blocks for the required conversion, SBF Converter will give an error such as that reported in Figure 4-6.

🔇 Fir	nished all conversio	ins				-	
	Source file	Conversion	Ouput File	Progress	Info/Errors	Open fil	e
1	test.sbf	RINEX	test.obs	No file	Details	Detai	, .
2	test.sbf	RINEX	test_gps.nav	No file	Details		RINEX stderror:
3	test.sbf	RINEX	test_glonass.nav	No file	Details		No relevant data available in the SBF file
					Cancel		No RINEX file created. Finished conversion with exit code: 2
							ОК

Figure 4-6: Error message when RINEX cannot be generated



4.2.2 Conversion to ASCII

The contents of an SBF file can be converted to the more readable ASCII format as shown in the sequence of screenshots in Figure 4-7. There are various options that can be selected for ASCII generation two of the most useful being *Show column titles* and, in order to have the output in a format compatible with other analysis tools; the *Change field delimiter to* option.

SBF Converter	
SBF Converter File Tools Help SBF file(s) selection Image: SBF file(s) selection SBF file(s) selection Image: SBF file(s) selection	BINZASC Conversion Options BINZASC options BINZASC options Messages To Be Converted ChannelStatus Commands1 Comment1 CorrPeakSample CorrValues DOP1 DOP2 DiffCorrIn EndOfMess EndOfMess EndOfMess Show headers Show column titles Output raw values instead of interpreted values Show all fields Decode DiffCorrIn messages
	Output to single file Output statistics Replace Do Not Use values with Other of the output statistics Cancel

Figure 4-7: Example of a converted DOP SBF block

Figure 4-8 on the next page show the ASCII conversion of the DOP SBF block where *Show column titles* has been selected and the field delimiter has been changed from the default comma to a double space.



×	C:\Use	rs\dean\DATA\A	F020710.13_SB	F_DOP2.txt -	Notepa	d++					
File	e Edit	t Search View	Encoding	Language	Settings	Macro	Run Te	xtFX Plugins	Window	?	Х
10	6	8 6 6 6		6 2 (2 #	b ∰ Q₹	چ ح	🔁 🚍 ¶	1= 🖉 🗉		▼ ▲ ≫
	AF020	710.13SBF_DO	P2.txt								
	1	TOW [s]	WNc [w]	NrSV	P	DOP	TDOP	HDOP	VDOP	HPL V	PL ^
	2										
	3	472628.000	1731	23	92	43	51	77	8.9504	16.6917	
	4	472629.000	1731	23	92	43	51	77	8.9506	16.6937	
	5	472630.000	1731	23	92	43	51	77	8.9513	16.6960	E
	6	472631.000	1731	23	92	43	51	77	8.9518	16.6981	
	7	472632.000	1731	23	92	43	51	77	8.9523	16.7001	
	8	472633.000	1731	23	92	43	51	77	8.9528	16.7022	
	9	472634.000	1731	23	92	43	51	77	8.9534	16.7046	
	10	472635.000	1731	23	92	43	51	77	8.9542	16.7071	
	11	472636.000	1731	23	92	43	51	77	8.9549	16.7096	
	12	472637.000	1731	23	92	43	51	77	8.9558	16.7124	
	13	472638.000	1731	23	92	43	51	77	8.9563	16.7144	
	14	472639.000	1731	23	92	43	51	77	8.9564	16.7163	
	15	472640.000	1731	23	92	43	51	77	8.9569	16.7184	
	16	472641.000	1731	23	92	43	51	77	8.9576	16.7207	
	17	472642.000	1731	23	92	43	51	77	8.9582	16.7229	
	18	472643.000	1731	23	92	43	51	77	8.9590	16.7254	
	19	472644.000	1731	23	92	43	51	77	8.9592	16.7271	
	20	472645.000	1731	23	92	43	51	77	8.9599	16.7294	
	21	472646.000	1731	2.3	92	43	51	77	8.9603	16.7314	
352	5 chars	3625 bytes 51	lines	Ln:51 (Col : 70	Sel : 0 (0 b	oytes) in 0 i	ranges	Dos\Wind	lows ANSI	INS

Figure 4-8: Configuration for ASCII conversion

In addition to **bin2asc**, you can find in the preferences menu of SBF Converter that there are two other possibilities for conversion to text format: **sbf2asc** which was created primarily as a sample application to assist users in developing their own conversion tools and the older **sbf2stf** which is being phased out in favour of **bin2asc**. These tools can also be used in the command line as is explained in Section 11 on page 164.



4.2.3 Conversion to Google Earth KML

Logged data files containing any of the SBF positioning blocks (i.e. PVTCartesian, PVTGeodetic, IntPVCart and IntPVGeod) can be converted to KML format which can be displayed on Google Earth. By clicking on the 'Options...' button next to the KML checkbox, you can select various settings for KML generation. Standard settings are shown in Figure 4-9.

SBF Converter	ก
<u>File</u> <u>T</u> ools <u>H</u> elp	
SBF file(s) selection	
Single file C:\Users\dean\DATA\test_2.sbf	KML Conversion Options
Multiple files Choose files	KML options File naming Destination Advanced
Time window	PVT Track Attitude Track Satellite Survey
Exclude blocks with invalid time (except for RINEX)	S KML Conversion Options
Epoch interval 1.00s	Cartesian & Geodetic Cartesian & Geodetic KML options File naming Destination Advanced
Ignore date for time window	Attitude Trai Geodetic only Cartesian only PVT Track Attitude Track Satellite Survey
First epoch 01/12/2006 - 12:00:00 -	Attitude blo Integrated Cartesian & Geodetic Integrated Geodetic only PVT Track Options
□ Last epoch 01/12/2006 ▼ 12:00:00 ♀	Draw 30 Integrated Cartesian only PVT blocks Cartesian & Geodetic Draw 30 model every 10 P Epochs
Convert to	Scale of 3D model
RINEX Options Commands Options	(iii) Use the default 3D Model: airplane Attitude blocks used Euler
ASCII (bin2asc) Options GPX Options	 Select you own 3D Model Draw 3D model on external events
KML (Google Earth) Options S8F Blocks Options	Model V Draw 3D model every 10 📩 Epochs
	Scale of 3D model 1 ×
Convert	Include Waypoints on change of mode O Use the default 3D Model: airplane
	Select you own 3D Model
	Show baseline between Rover and Base Station(s)
	Change track colour with a change of PVT/Attitude Include Waypoints on error
	💿 Track colour: Change Defaul 🔄 Include Waypoints on change of mode
	Track width 2.5 👘 🔲 Include Waypoints on external events
	Altitude mode Clamp to ground Show baseline between Rover and Base Station(s)
	Satellite tracks in the sky None Change track colour with a change of PVT/Attitude mode
	Show satellite tracks for All Satellites Track colour: Change Default
	Track width 2.5 ≑
	Altitude mode Relative to ground
	Satellite trads in the sky Good to ground Relative to ground Show satellite trads for Articles
	OK Cancel

Figure 4-9: Configuration for KML conversion

When the conversion has finished, the file can be opened in Google Earth by clicking on the 'Open' button as shown in Figure 4-10.

Sourceme	Conversion	Ouput File	Progress	Info/Errors Open f	ile		
test_2.sbf	KML	test_2.kml	62%	Details Open			
		S Finished all co	onversions				
		Source f	Source file Conversion		Progress	Info/Errors	Open file
		1 test_2.s	bf KML	test_2.kml	Done	Details	Open

Figure 4-10: Opening the converted file

The results of the KML conversion are given in Figure 4-10 which shows the trajectory of a car test. The color of the trajectory indicates the positioning mode as given in the legend. The zoomed panel shows a fall-back from RTK fixed positioning mode to differential then RTK float which is due to the car going under a bridge.

For the AsteRx2eH and AsteRx2i receivers that can additionally output attitude, selecting 'Attitude Track' in the KML options tab will show the vehicle trajectory where the color indicates the attitude mode.



The color of the track when selecting the 'Satellite Survey' option indicates the satellite tracking status: no tracking, tracked or tracked and PVT.



Figure 4-11: KML file displayed in Google Earth