



Application Note

Using an External Program to Control The SF1000

Applicable Products

SF1000
SF100E
SF800
SF800E

Description

The Signal Forge 1000 (SF1000) comes with an embedded control application which allows complete control of the device without the need to write any code or install any client-based software. However, some customers prefer to operate the SF1000 programmatically using an external application. This application note describes how to use an external control file to operate the SF1000.

Overview

The Wave Manager software, which is installed onboard the SF1000, is an embedded, menu-driven application which is used to configure and modify the SF1000 operation. Wave Manager uses keyboard-driven menus so to operate the SF1000 using an external program or test controller, you must simply emulate the keystrokes as if you were manually traversing the Wave Manager menus. A sequence of keystrokes may be stored in a control file and sent to the SF1000 using a serial communication utility such as HyperACCESS, or using an external test control device and sent to the SF1000 over its RS-232 interface.

Creating a Control File

The SF1000's keyboard input method uses a one-to-one mapping from keystrokes to characters: for each keystroke (which corresponds to a menu selection or numeric value), one character is generated.

Control files may contain an entire sequence of keyboard characters, such as the series of keystrokes needed to configure the SF1000 for a specific output type, frequency, and modulation, or they may contain a limited set of characters as needed to modify operating parameters (such as changing the frequency or power) during operation.

While control files may be stored as an ASCII text file, you will need a hex editor to convert keystrokes such as ESC and RETURN into ASCII characters.

NOTE: A delay of 250ms is required after each character. Some serial communication utilities, such as HyperACCESS, can insert the character delay for you.

Suggested Hex editors include: Codewrite (www.borland.com.tr/tr/products/codewright/index.html) and Hex-editor XVI32 (www.chmaas.handshake.de/delphi/freeware/xvi32/xvi32.htm).

Sending the Control File to the SF1000

Hilgraeve's HyperACCESS ([www. Hilgraeve.com](http://www.Hilgraeve.com)) is an easy to use, Windows-compatible program which may be used to transfer control files to the SF1000 since it automatically inserts the 250ms character delay.

To use HyperACCESS:

1. Connect your computer to the SF1000 using a serial cable.
2. Start HyperACCESS
3. Set the transfer properties (rate, Xon/Xoff) under P)roperties C)ommunications.
4. Configure the character delay of 250ms. You can set the character delay under P)roperties C)ommunications A)scii sending.
5. Select "text" as the file transfer protocol
6. Start transfer

External Controller

Since all SF1000 commands are one keystroke, configuration and control may be automated by connecting it to an external controller which supports serial communication.

The controller just needs to send ASCII characters in a sequence that emulates the keystrokes that a user would enter when configuring or controlling the SF1000 manually. Note: the controller must also be able to insert the 250ms character delay discuss above.

Examples

To configure the SF1000 to output a waveform with the following characteristics

- RF output (AC-coupled)
- Single tone
- Frequency: 900 MHz
- Power: 5 dBm

Your script would contain the following character sequence:

Keystroke	Description/Comment
ESC<pause>	Two escapes ensures your are at the top menu level
ESC<pause>	
C<pause>	Waveform creation menu
C<pause>	New waveform type
A<pause>	Single tone
A<pause>	Edit parameters
A<pause>	Output
A<pause>	AC coupled output
B<pause>	Frequency
900000000<pause>	Sets frequency to 900 MHz
ENTER<pause>	Enter accepts value
O<pause>	dBm base power select
D<pause>	Lowers dbm by 1 (default is +7)
D<pause>	Lowers dbm by 1 (default is +7)
ENTER<pause>	Enter accepts value
ESC<pause>	Returns to previous menu
D	Run waveform

Sample Control File

A sample control file may be downloaded from our web site

http://www.signalforge.com/home/sf1/smartlist_11/Application_Notes.html

Modifying Waveforms “On the Fly”

While the above waveform is running, you may change the frequency or power. For example, to change the frequency 900 MHz to 150 MHz your controller would send the following sequence in ASCII Text:

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A<pause>
F<pause>
150000000<pause>
ENTER
```

ASCII Table

Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)	32	20	040			64	40	100			96	60	140		
1	1	001	SOH (start of heading)	33	21	041			65	41	101			97	61	141		
2	2	002	STX (start of text)	34	22	042			66	42	102			98	62	142		
3	3	003	ETX (end of text)	35	23	043			67	43	103			99	63	143		
4	4	004	EOT (end of transmission)	36	24	044			68	44	104			100	64	144		
5	5	005	ENQ (enquiry)	37	25	045			69	45	105			101	65	145		
6	6	006	ACK (acknowledge)	38	26	046			70	46	106			102	66	146		
7	7	007	BEL (bell)	39	27	047			71	47	107			103	67	147		
8	8	010	BS (backspace)	40	28	050			72	48	110			104	68	150		
9	9	011	TAB (horizontal tab)	41	29	051			73	49	111			105	69	151		
10	A	012	LF (NL line feed, new line)	42	2A	052			74	4A	112			106	6A	152		
11	B	013	VT (vertical tab)	43	2B	053			75	4B	113			107	6B	153		
12	C	014	FF (NP form feed, new page)	44	2C	054			76	4C	114			108	6C	154		
13	D	015	CR (carriage return)	45	2D	055			77	4D	115			109	6D	155		
14	E	016	SO (shift out)	46	2E	056			78	4E	116			110	6E	156		
15	F	017	SI (shift in)	47	2F	057			79	4F	117			111	6F	157		
16	10	020	DLE (data link escape)	48	30	060			80	50	120			112	70	160		
17	11	021	DC1 (device control 1)	49	31	061			81	51	121			113	71	161		
18	12	022	DC2 (device control 2)	50	32	062			82	52	122			114	72	162		
19	13	023	DC3 (device control 3)	51	33	063			83	53	123			115	73	163		
20	14	024	DC4 (device control 4)	52	34	064			84	54	124			116	74	164		
21	15	025	NAK (negative acknowledge)	53	35	065			85	55	125			117	75	165		
22	16	026	SYN (synchronous idle)	54	36	066			86	56	126			118	76	166		
23	17	027	ETB (end of trans. block)	55	37	067			87	57	127			119	77	167		
24	18	030	CAN (cancel)	56	38	070			88	58	130			120	78	170		
25	19	031	EM (end of medium)	57	39	071			89	59	131			121	79	171		
26	1A	032	SUB (substitute)	58	3A	072			90	5A	132			122	7A	172		
27	1B	033	ESC (escape)	59	3B	073			91	5B	133			123	7B	173		
28	1C	034	FS (file separator)	60	3C	074			92	5C	134			124	7C	174		
29	1D	035	GS (group separator)	61	3D	075			93	5D	135			125	7D	175		
30	1E	036	RS (record separator)	62	3E	076			94	5E	136			126	7E	176		
31	1F	037	US (unit separator)	63	3F	077			95	5F	137			127	7F	177		

Source: www.LookupTables.com