Appendix B – File Descriptions

Signature File Format

The Signature (SIG) File Format is a text file that contains a header followed by spectral data information. Each line of the header begins with a keyword tag, as defined below:

Line	Keyword Tag	Fields	Description
1	/*** Spectra Vista SIG Data ***/	None	This line must appear exactly as shown in order for the file to be recognized as a current SIG format file.
2	name=	F1	F1 is the SIG file name.
3	instrument=	F1 :F2	F1 is the instrument's model number. F2 is the instrument's extended serial number.
4	integration=	R1,R2,R3,T1,T2, T3	R1, R2, R3 are the reference scan integration times (in milliseconds) for the Si, InGaAs1, and InGaAs2 detectors respectively. T1, T2, T3 are the target scan integration times (in milliseconds) for the Si, InGaAs1, and InGaAs2 detectors respectively.
5	scan method=	R1, T1	R1/T1 is the reference/target scanning method used to determine the length of the scan: "Time-based" – fixed scan time "Coadd-based" – fixed coadd number
6	scan coadds=	R1,R2,R3,T1,T2, T3	Rx/Tx is the reference/target coadds acquired as part of the scan for each spectrometer
7	scan time=	R1, T1	R1 is the reference scan time setting (seconds). T1 is the target scan time setting (seconds).
8	scan settings=	R1, T1	R1 is the reference scan integration type ("AI" = Auto integration , "FI" = Fixed integration, "UI" = unknown) T1 is the target scan integration type ("AI" = Auto integration , "FI" = Fixed integration, "UI" = unknown)
9	external data set1=	R1,R2,R3,R4,R5, R6,R7,R8,T1,T2, T3,T4,T5,T6,T7, T8	R1-R8 are set #1 of the reference scan external data samples, or [PC Software Only] 0 if disabled. T1-T8 are set #1 of the target scan external data samples, or [PC Software Only] 0 if disabled. Each sample is in the range –32K to +32K.
10	external data set2=	R1,R2,R3,R4,R5, R6,R7,R8,T1,T2, T3,T4,T5,T6,T7, T8	R1-R8 are set #2 of the reference scan external data samples, or [PC Software Only] 0 if disabled. T1-T8 are set #2 of the target scan external data samples, or [PC Software Only] 0 if disabled. Each sample is in the range –32K to +32K.
11	external data dark=	D1,D2,D3,D4, D5,D6,D7,D8	[PC Software Only] D1-D8 are the most recent external dark data samples. These values are acquired when the "Dark Scan" button is pressed.

			Each sample is in the range –32K to +32K.
12	external data mask=	X1	[PC Software Only] X1 is the 8-bit decimal encoded value that represents which external channel has been enabled. A "1" -> channel enabled, or a "0" -> channel disabled. For example, a mask value of 5 would mean channels 1 and 3 are enabled. External Data Masks values range from 0 (no channels enabled) to 255 (all channels enabled).
13	optic=	R1, T1	R1 is the fore-optic name in use in the reference scan. T1 is the fore-optic name in use in the target scan.
14	temp=	R1,R2,R3,T1,T2, T3	R1, R2, R3 are the reference scan reported temperature values (in °C) for the Si, InGaAs1, and InGaAs2 detector respectively. T1, T2, T3 are the target scan reported temperature values (in °C) for the Si, InGaAs1, and InGaAs2 detectors respectively.
15	battery=	R1,T1	R1/T1 is the reported battery voltage during the reference/target scan.
16	error=	R1,T1	R1/T1 is the reported error code (if any) during the reference/target scan. An error value of 0 (zero) means no error occurred.
17	units=	R1, T1	R1/T1 are the types of units associated with the scan data: "Radiance" – units of radiance "Irradiance" – units if irradiance "Counts" – raw counts uncorrected for calibration factors
18	time=	R1,T1	R1/T1 is the system time that the reference/target scan was acquired.
19	longitude=	R1,T1	R1/T1 is the GPS reported longitude when the reference/target was acquired. GPS fields are blank if the optional GPS unit is not installed, or was not producing position information at the time of the scan. (The exact format is described below in the SIG File GPS Data Format paragraph).
20	latitude=	R1,T1	R1/T1 is the GPS reported latitude for the reference/target scan.
21	gpstime=	R1,T1	R1/T1 is the GPS reported time for the reference/target scan.
22	comm=	F1	The F1 field provides space for any user-supplied comment.
23	memory slot=	R1,T1	If the spectral data was originally acquired by the HR-1024i in stand-alone mode, R1/T1 are the internal scan numbers within the HR-1024's scan memory. If the data was acquired by the PDA or PC Acquisition Software, these fields are both set to 0 (zero).
24	factors=	F1,F2,F3	F1/F2/F3 are the matching factors used to match Si and InGaAs1 detector data. F1 is the reference radiance matching factor.

			F2 is the target radiance matching factor. F3 is the reflectance matching factor.
25	data=	None	This tag marks the beginning of the spectral data. The format of each line of spectral data is described below in the SIG File Spectral Data Format paragraph.

SIG File GPS Data Format

Note that the GPS information in the header is only available when an optional GPS data source is installed in the PDA. When present, the GPS components have the following format:

GPS Longitude	DDDmm.mmmmC
GPS Latitude	DDmm.mmmmC
GPS Time	HHmmSS.SSS

where:

D	is degrees
m	is decimal minutes
C	is quadrant (N, S, E, W)
H	is hours (GMT, 24-hour format)
S	is seconds

Note that depending on the GPS source, the exact format may vary; for example, there may be fewer significant decimal points present for the Lat/Lon "minutes" field, or the Time "seconds" field may be truncated to contain only integral values.

SIG File Spectral Data Format

Following the header are four columns of data:

Column 1: Wavelengths (nanometers)
Column 2: Reference Values (see below)
Column 3: Target Values (see below)
Column 4: Reflectance (percent)

Reference/Target Values' units depend on which calibration table or fore-optic was in use:

Radiance: 10^{-10} * W/(cm² * nm * sr)
Irradiance: 10^{-10} * W/(cm² * nm)
RAW DN: counts

SIG File Example:

/*** Spectra Vista SIG Data ***/
name= dltest_000.sig
instrument= F1: 0503353
integration= 200, 135, 145, 200, 135, 145
scan method= Time-based, Time-based
scan coadds= 14, 23, 78, 14, 23, 78
scan time= 5, 5
scan settings= AI, AI
external data set1= 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
external data set2= 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
external data dark= 0,0,0,0,0,0,0,0
external data mask= 0
optic= Optic1, Optic1
temp= 25.3, -1.2, -5.7, 25.3, -1.2, -5.7
battery= 8.16, 8.15
error= 0, 0
units= Radiance, Radiance
time= 2/28/2006 2:37:42 PM, 2/28/2006 2:37:48 PM
longitude= 07351.2674W, 07351.2674W
latitude= 4140.6700N, 4140.6700N
gpstime= 193332.68, 193332.68
comm= comments go here
memory slot= 1, 2
factors= `0.980, 0.972, 1.000`
data=
357.7 584.00 485.00 83.05
359.3 606.00 506.00 83.50
360.9 697.00 532.00 76.33
362.5 676.00 504.00 74.56
364.1 700.00 524.00 74.86
365.7 724.00 544.00 75.14
367.3 744.00 565.00 75.94
368.9 768.00 584.00 76.04
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