ASPEN BOX LOG FILE LEGEND – SECTION 1 – HEADER DATA

	PARAMETER	VALUE	UNITS/NOTES
1	PARAMETER	VALUE	UNITS/NOTES
2	ASPENserial	ABXXXXX	(ASPEN box serial identification)
3	HMserial	HMXXXXX	(Disco board serial identification)
4	HDserial	HDXXXXX	(Shield serial identification)
5	HP1serial	HPXXXXX	(Filter 1 pump serial identification)
6	HP2serial	HPXXXXX	(Filter 2 pump serial identification)
7	HGserial	HGXXXXX	(Gas module serial identification)
8	COserial	A nine-digit number	(CO gas sensor serial identification)
9	NO2serial	A nine-digit number	(NO_2 gas sensor serial identification)
10	O3serial	A nine-digit number	(O_3 gas sensor serial identification)
11	CO2serial	20-digit number formatted as xxxxxxx-xxxxxxx-xxxxxx	(CO_2 gas sensor serial identification)
12	Firmware	Version of firmware running on the ASEPN Box	(Installed firmware version)
17	CALIBRATION COEFFICIENTS		
19	CO2Slope	Slope of linear model fit to CO_2 sensor calibration data	(coefficient)
20	CO2Intercept	Intercept of model fit to CO_2 sensor calibration data	(coefficient)
25	SAMPLE IDENIFICATION		
27	LogFilename	Name of the file as saved on the microSD card	(log file filename-automatically defined)
28	SampleName	Sample name as entered in the mobile application	(sample name)
29	CIDfilter1	Filter sample 1 cartridge ID as entered in the app	(Filter 1 cartridge id)
30	CIDfilter2	Filter sample 2 cartridge ID as entered in the app	(Filter 2 cartridge id)
35	SETUP SUMMARY		
37	GPSUTCOffset	UTC offset for local time zone	(hours offset from UTC date time)
38	ProgrammedStartUnixtime	Unix time when sample was programmed to start	(s) (0 means 'now')
39	ProgrammedRuntime	Programmed duration for real-time data log	(s) (360000000 means 'indefinite')
40	Filter1ProgrammedRuntime	Programmed duration for filter sample 1	(s) (360000000 means 'indefinite')
41	Filter2ProgrammedRuntime	Programmed duration for filter sample 2	(s) (360000000 means 'indefinite')
42	Filter1VolumetricFlowRate	Programmed volumetric flow rate for filter sample 1	$(L*min^{-1})$
43	Filter2VolumetricFlowRate	Programmed volumetric flow rate for filter sample 2	$(L*min^{-1})$
44	Filter1DutyCycle	Programmed duty cycle for filter sample 1	(%)
45	Filter2DutyCycle	Programmed duty cycle for filter sample 2	(%)
46	AppVersion	The version of the app used to program the sample	(i=iOS)
51	SAMPLE SUMMARY		
53	StartDateTimeUTC	UTC Date/Time when real-time data started logging	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
54	Filter1StartDateTimeUTC	UTC Date/Time when filter sample 1 started	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
55	Filter2StartDateTimeUTC	UTC Date/Time when filter sample 2 started	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
56	EndDateTimeUTC	UTC Date/Time when real-time data stopped logging	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
57	Filter1LastUpdateUTC	UTC Date/Time when filter sample 1 data last updated	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
58	Filter2LastUpdateUTC	UTC Date/Time when filter sample 2 data last updated	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
59	Filter1ShutdownMode	Why did filter sample 1 end?	(0=unknown error
60	Filter2ShutdownMode	Why did filter sample 2 end?	1=user pushbutton stop
			2=depleted battery
			3=completed preset sample duration
			4=thermal protection shutdown
			5=max power at initialization
			6=max power during sample
			7=blocked flow during sample)
61	Filter1SampledVolume	Volume of air sampled through filter 1	(L)
62	Filter2SampledVolume	Volume of air sampled through filter 2	(L)
63	ASPENSampledRuntime	Duration for which real-time data were logged	(Hr)
64	Filter1SampledRuntime	Duration for which air was sampled through filter 1	(Hr)
65	Filter2SampledRuntime	Duration for which air was sampled through filter 2	(Hr)
66	Filter1AverageVolumetricFlowRate	Average volumetric flow rate during filter sample 1	$(L*min^{-1})$
67	Filter2AverageVolumetricFlowRate	Average volumetric flow rate during filter sample 2	$(L*min^{-1})$

ASPEN BOX LOG FILE LEGEND – SECTION 2 – SAMPLE LOG

Headers specifying the units for each column in the sample log are on line 74. Descriptive column headers are on line 75. The log data begin on line 76. Each of the 48 columns in the sample log is listed below (PARAMETER = descriptive column header), along with a short description (VALUE), and the unit header (UNITS/NOTES).

	PARAMETER	VALUE	UNITS/NOTES
1	SampleTime	Time stamp of the logged data point relative to the start of the sample.	(HH:MM:SS)
2	UnixTime	Unix time stamp	(s)
3	DateTimeUTC	UTC Date/Time	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
4	DiscoTemp	Temperature measured on the surface of the main circuit board	(C)
5	DiscoRH	Relative humidity measured at the surface of the main circuit board	(%)
6	DiscoPress	Absolute pressure measured at the surface of the main circuit board	(hPa)
7	ExternalTemp	Temperature measured by the external probe in the radiation shield	(C)
8	ExternalRH	Relative humidity measured by the external probe in the radiation shield	(%)
9	GasTemp	Temperature measured in the gas sensor housing	(C)
10	GasRH	Relative humidity measured in the gas sensor housing	(%)
11	CO2Raw	Uncorrected CO_2 concentration reported by low-cost NDIR sensor	(ppm)
12	CO2Adj	Corrected CO_2 concentration calculated as: CO2Adj = (CO2Raw – CO2Intercept) / CO2Slope	(ppm)
13	COweReading	Reading from the analog-to-digital converter used to log data from the working electrode on the carbon monoxide sensor	(integer)
14	COweV	Carbon monoxide sensor working electrode voltage	(V)
15	COauxReading	Reading from the analog-to-digital converter used to log data from the auxiliary electrode on the carbon monoxide sensor	(integer)
16	COauxV	Carbon monoxide sensor auxiliary electrode voltage	(V)
17	NO2weReading	Reading from the analog-to-digital converter used to log data from the working electrode on the nitrogen dioxide sensor	(integer)
18	NO2weV	Nitrogen dioxide sensor working electrode voltage	(V)
19	NO2auxReading	Reading from the analog-to-digital converter used to log data from the auxiliary electrode on the nitrogen dioxide sensor	(integer)
20	NO2auxV	Nitrogen dioxide sensor auxiliary electrode voltage	(V)
21	O3weReading	Reading from the analog-to-digital converter used to log data from the working electrode on the oxidizing gas (O_3 + NO_2) sensor	(integer)
22	O3weV	Oxidizing gas (O_3 + NO_2) sensor working electrode voltage	(V)
23	O3auxReading	Reading from the analog-to-digital converter used to log data from the auxiliary electrode on the oxidizing gas (O_3 + NO_2) sensor	(integer)
24	O3auxV	Oxidizing gas (O_3 + NO_2) sensor auxiliary electrode voltage	(V)
25	SPS30pm1	$PM_{1.0}$ concentration reported by the Sensirion SPS30 sensor	(ug*m^-3)
26	SPS30pm2.5	$PM_{2.5}$ concentration reported by the Sensirion SPS30 sensor	(ug*m^-3)
27	SPS30pm4	$PM_{4.0}$ concentration reported by the Sensirion SPS30 sensor	(ug*m^-3)
28	SPS30pm10	PM_{10} concentration reported by the Sensirion SPS30 sensor	(ug*m^-3)
29	SPS30pn0.5	Number concentration of 0.3 to 0.5 µm particles reported by SPS30	(#*cm^-3)
30	SPS30pn1	Number concentration of 0.3 to 1.0 µm particles reported by SPS30	(#*cm^-3)
31	SPS30pn2.5	Number concentration of 0.3 to 2.5 µm particles reported by SPS30	(#*cm^-3)
32	SPS30pn4	Number concentration of 0.3 to 4.0 µm particles reported by SPS30	(#*cm^-3)
33	SPS30pn10	Number concentration of 0.3 to 10 µm particles reported by SPS30	(#*cm^-3)
34	SPS30typicalParticleSize	Typical particle size reported by the Sensirion SPS30 sensor	(µm)
35	PMS5003pm1cf1	$PM_{1.0}$ concentration reported by PMS5003 sensor (correction factor = 1)	(ug*m^-3)
36	PMS5003pm2.5cf1	$PM_{2.5}$ concentration reported by PMS5003 sensor (correction factor = 1)	(ug*m^-3)
37	PMS5003pm10cf1	PM_{10} concentration reported by PMS5003 sensor (correction factor = 1)	(ug*m^-3)
38	PMS5003pm1atm	$PM_{1.0}$ concentration reported by PMS5003 (atmospheric correction)	(ug*m^-3)
39	PMS5003pm2.5atm	$PM_{2.5}$ concentration reported by PMS5003 (atmospheric correction)	(ug*m^-3)
40	PMS5003pm10atm	PM_{10} concentration reported by PMS5003 (atmospheric correction)	(ug*m^-3)
41	PMS5003count0.3	Number concentration of particles larger than 0.3 µm	(#*0.1L^-1)
42	PMS5003count0.5	Number concentration of particles larger than 0.5 µm	(#*0.1L^-1)
43	PMS5003count1	Number concentration of particles larger than 1.0 µm	(#*0.1L^-1)
44	PMS5003count2.5	Number concentration of particles larger than 2.5 µm	(#*0.1L^-1)
45	PMS5003count5.0	Number concentration of particles larger than 5.0 µm	(#*0.1L^-1)
46	PMS5003count10	Number concentration of particles larger than 10 µm	(#*0.1L^-1)
47	PMS5003readTime	Engineering check of time to read the Plantower PMS5003 data	(s)
48	SensorReadLogTime	Engineering check of total time to read and log all sensor data	(s)