

ASPEN BOX LOG FILE LEGEND – SECTION 1 – HEADER DATA

1	PARAMETER	VALUE	UNITS/NOTES
2	UPASserial	UPAS serial ID	(UPAS serial identification-numerical)
3	UPASfirmware	Current version of firmware running on the UPAS	(installed firmware version)
4	LifetimeSampleCount	Number of samples started in the lifetime of the UPAS	(count-total lifetime sample runs)
5	LifetimeSampleRuntime	Number of cumulative sample hours in the lifetime of the UPAS	(hrs-total lifetime cumulative sample runtime)
6			
7			
8			
9			
10	SAMPLE IDENTIFICATION		
11			
12	UPASlogFilename	Name of the file as saved on the SD card	(log file filename-automatically defined)
13	SampleName	Sample name as entered in the App	(Sample Name-user entered into app)
14	CartridgeID	Filter cartridge ID as entered in the App	(Cartridge Identification-user entered into app)
15			
16			
17			
18			
19	SETUP SUMMARY		
20			
21	GPSUTCOffset	UTC offset for local time zone	(hours offset from UTC date time)
22	StartOnNextPowerUp	Is the UPAS programmed to start on next power-on?	(0=no 1=yes)
23	ProgrammedStartDelay	Programmed delay between App start and UPAS program run	(s)
24	ProgrammedRuntime	Programmed run time	(s) (360000000 means 'indefinite')
25	VolumetricFlowRate	Programmed volumetric flow rate	(L*min ⁻¹)
26	FlowOffset	Flow offset as entered in the App	(%)
27	DutyCycle	Programmed duty cycle	(%)
28	DutyCycleWindow	Period of duty cycle	(s)
29	GPSEnabled	Was the GPS enabled during the programmed run?	(0=no 1=yes)
30	LogFileMode	Was data logged normally (every 30 seconds) or in debug mode (every second)?	(0=normal 1=debug)
31	LogInterval	Interval between logged data points during sampling	(s)
32	AppLock	Status of App Lock	(0=unlocked 1=locked -1=not set)
33	AppVersion	The version of the app used to program the UPAS	(i=iOS A=Android)
34			
35			
36			
37			
38	SAMPLE SUMMARY		
39			
40	StartDateTimeUTC	UTC Date/Time when sample started	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
41	StartDateTimeLocal	Local Date/Time when sample started	(YYYY-MM-DDTHH:MM:SS) (Local date time format)
42	StartBatteryCharge	Battery state of charge when sample started	(%)
43	StartBatteryVoltage	Battery voltage when sample started	(V)
44	EndDateTimeUTC	UTC Date/Time when sample ended	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
45	EndDateTimeLocal	Local Date/Time when sample ended	(YYYY-MM-DDTHH:MM:SS) (Local date time format)
46	EndBatteryCharge	Battery state of charge when sample ended	(%)
47	EndBatteryVoltage	Battery voltage when sample ended	(V)
48	ShutdownMode	Why did the UPAS power off?	(0=unknown error 1=user pushbutton stop 2=depleted battery [<2.8v] 3=completed preset sample duration 4=thermal protection shutdown 5=max power at initialization 6=max power during sample 7=blocked flow during sample)
49	SampledVolume	The volume of air sampled through the filter	(L)
50	SampledRuntime	Total sample runtime	(Hr)
51	LoggedRuntime	Total logged sample runtime	(Hr)
52	AverageVolumetricFlowRate	Average volumetric flow rate during sample runtime	(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 59. Descriptive column headers are on line 60. The log data begin on line 61. Each of the 32 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. The value 99:99:99 seen at the beginning of 'Debug' log files (only) represents operation before the UPAS was operating in the control initialization window (<1% setpoint error). The UPAS will record data log lines (rows) with incremental time stamps after reaching the control initialization window. 'Normal' log files begin logging only after the control initialization window is reached	(HH:MM:SS)
2	UnixTime	Unix time stamp	(s)
3	DateTimeUTC	UTC Date/Time	(YYYY-MM-DDTHH:MM:SS)
4	DateTimeLocal	Local Date/Time	(YYYY-MM-DDTHH:MM:SS) (Local date time format)
5	VolumetricFlowRate	Volumetric flow rate of air	(L*min ⁻¹)
6	SampledVolume	Cumulative volume of air sampled	(L)
7	PumpT	Temperature near pump	(C)
8	PCBT	Temperature near printed circuit board	(C)
9	FDPT	Temperature near filter	(C)
10	PumpP	Absolute pressure in pumping manifold	(hPa)
11	PCBP	Absolute pressure on printed circuit board (ambient pressure)	(hPa)
12	FdPdP	Differential pressure across filter	(Pa)
13	PumpRH	Relative humidity	(%)
14	AtmoRho	Air density (calculated)	(g*L ⁻¹)
15	PumpPow1	Relative pump power setting 1 (inverted scale)	(integer)
16	PumpPow2	Relative pump power setting 2 (inverted scale)	(integer)
17	PumpV	Pump drive voltage	(V)
18	MassFlow	Mass flow rate of air	(g*min ⁻¹)
19	BFGvolt	Battery voltage	(V)
20	BFGenergy	Battery energy (arbitrary scale)	(integer)
21	PM1_0RAW	PM _{1.0} CF=1 concentration reported by the standalone PMS5003 sensor in the ASPEN box	(ug*m ⁻³)
22	PM2_5RAW	PM _{2.5} CF=1 concentration reported by the PMS5003 sensor	(ug*m ⁻³)
23	PM10RAW	PM ₁₀ CF=1 concentration reported by the PMS5003 sensor	(ug*m ⁻³)
24	PM1_0ADJ	PM _{1.0} ATM concentration reported by the PMS5003 sensor	(ug*m ⁻³)
25	PM2_5ADJ	PM _{2.5} ATM concentration reported by the PMS5003 sensor	(ug*m ⁻³)
26	PM10_0ADJ	PM ₁₀ ATM concentration reported by the PMS5003 sensor	(ug*m ⁻³)
27	CNT0_3	Number of particles larger than 0.3 µm per liter of air as reported by the PMS5003 sensor	(integer)
28	CNT0_5	Number of particles larger than 0.5 µm per liter of air	(integer)
29	CNT1_0	Number of particles larger than 1.0 µm per liter of air	(integer)
30	CNT2_5	Number of particles larger than 2.5 µm per liter of air	(integer)
31	CNT5_0	Number of particles larger than 5.0 µm per liter of air	(integer)
32	CNT10	Number of particles larger than 10 µm per liter of air	(integer)