LOG FILE LEGEND - SECTION 1 - HEADER DATA

Parameter	Value	Units/Notes
UPASserial	UPAS serial ID	(UPAS serial identification-numerical)
UPASfirmware	Current version of firmware running on the UPAS	(installed firmware version)
LifetimeSampleCount	Number of samples started in the lifetime of the UPAS	(count-total lifetime sample runs)
LifetimeSampleRuntime	Number of cumulative sample hourse in the lifetime of the UPAS	(hrs-total lifetime cumulative sample runtime)
SAMPLE IDENTIFICATION		
UPASlogFilename	Name of the file as saved on the SD card	(installed firmware version)
SampleName	Sample name as entered in the App	(count-total lifetime sample runs)
CartridgeID	Cartridge ID as entered in the App	(hrs-total lifetime cumulative sample runtime)
SETUP SUMMARY		
GPSUTCOffset	UTC offset for local time zone	(hours offset from UTC date time)
StartOnNextPowerUp	Programming the UPAS to start on next power-on	(0=no 1=yes)
ProgrammedStartDelay	Programmed delay between App start and UPAS program run	(s)
ProgrammedRuntime	Programmed run time	(s) (360000000 means 'indefinite')
VolumetricFlowRate	Programmed volumetric flow rate	(L*min^-1)
FlowOffset	Flow offset as entered in the App	(%)
DutyCycle	Programmed duty cycle	(%)
DutyCycleWindow	Period of duty cycle	(s)
GPSEnabled	GPS status during the programmed run is indicated by the listed outputs 0 = the GPS was disabled during the sample 1 = the GPS was enabled during the sample	(0=no 1=yes)
LogFileMode	Type of log being recorded is indicated by the listed outputs. 0 = data was logged normally every 30 seconds 1 = data was logged every second in debug mode	(0=normal 1=debug)
LogInterval	Interval between logged data points during sampling	(s)
AppLock	Status of App Lock 0 = the settings are unlocked and can be modified in the App 1 = the settings are locked and cannot be changed until unlocked -1 = The App Lock is not set	(0=unlocked 1=locked -1=not set)
AppVersion	Current App version used to program the UPAS	(i=iOS A=Android)
SAMPLE SUMMARY		
StartDateTimeUTC	UTC Date/Time when sample started	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
StartDateTimeLocal	Local Date/Time when sample started	(YYYY-MM-DDTHH:MM:SS) (Local date time format)
StartBatteryCharge	Battery SOC % when sample started	(%)
StartBatteryVoltage	Battery Voltage when sample started	(V)
EndDateTimeUTC	UTC Date/Time when sample ended	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)
EndDateTimeLocal	Local Date/Time when sample ended	(YYYY-MM-DDTHH:MM:SS) (Local date time format)
EndBatteryCharge	Battery SOC % when sample ended	(%)
EndBatteryVoltage	Battery Voltage when sample ended	(V)
ShutdownMode	The fault events that force the UPAS to power-off are listed below 0 = an unknown fault occurred 1 = the user stopped the program run with the push button 2 = the battery depleted (<2.8 V) 3 = the program run finished successfully at duration 4 = the device heated to 60°C or more for more than 30 seconds 5 = The pumps reached maximum power while initializing sampling 6 = The pumps reached maximum power during a controlled sampling 7 = The flow was blocked during the program run	(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)
SampledVolume	Sample volume through filter during sample runtime	(L)
SampledRuntime	Total sample runtime	(Hr)
LoggedRuntime	Total logged sample runtime	(Hr)
AverageVolumetricFlowRate	Average volumetric flow rate during sample runtime	(L*min^-1)

LOG FILE LEGEND - SECTION 2 - SAMPLE LOG			
Log file type / activation	Parameter	Unit	Value
Normal Log - GPS off; Normal log - GPS ON - MicroEnvironment Sense ON; Normal log - GPS ON - MicroEnvironment Sense ON; Debug Log	SampleTime	(HH:MM:SS)	Relative time stamp of the logged data point. Note, 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 type files begin logging only after the initial control window is reached.
	UnixTime	(s)	Unix time stamp
	DateTimeUTC	(YYYY-MM-DDTHH:MM:SS) (UTC date time format)	UTC Date/Time
	DateTimeLocal	(YYYY-MM-DDTHH:MM:SS) (Local date time format)	Local Date/Time
	VolumetricFlowRate	(L/minute)	Volumetric flow rate
	SampledVolume	(L)	Cumulative sample volume
	PumpT	(C)	Temperature near pump
	PCBT	(C)	Temperature near circuit board
	FdpT	(C)	Temperature near filter
	PumpP	(hPa)	Absolute pressure in pumping manifold
	PCBP	(hPa)	Absolute pressure on circuit board (ambient)
	FdPdP	(Pa)	Differential pressure across filter
	PumpRH	(%)	Relative humidity
	AtmoRho	(g/L)	Air density (calculated)
	PumpPow1	(integer)	Relative pump power setting 1 (inverted scale)
	PumpPow2	(integer)	Relative pump power setting 2 (inverted scale)
	PumpV	(V, Vpp)	Pump drive voltage
	MassFlow	(g/minute)	Mass flow rate
	BFGvolt	(V)	Battery voltage
	BFGenergy	(integer)	Battery energy (arbitrary scale)
	GPSlat	(decimalDegree)	GPS latitude coordinate
	GPSlon	(decimalDegree)	GPS longitude coordinate
	GPSalt	(m)	GPS altitude above sea level
	GPSsat	(integer)	Number of GPS satellite signals being received
	GPSspeed	(m/second)	GPS-measured velocity
	GPShdop	(-)	GPS position dilution of precision
	GPSquality	(integer)	GPS signal quality level
	home1distance	(m)	Distance from MicroEnvironment location 1
	home2distance	(m)	Distance from MicroEnvironment location 2
	school1distance	(m)	Distance from MicroEnvironment location 3
	school2distance	(m)	Distance from MicroEnvironment location 4
Debug log (cont'd)	MFlowDelta	delta(g/minute)/second	Time rate change of mass flow rate
	VFlowDelta	delta(L/minute)/second	Time rate change of volumetric flow rate
	MFSADS	(integer)	Mass flow sensor signal analog-digital convert value
	VInADS	(integer)	3.3V rail voltage analog-digital convert value
	PumpADS	(integer)	Pump drive voltage analog-digital convert value
	MFSVolt	(V)	Mass flow sensor signal voltage
	PumpsON	(bool)	Pump power status indicator
	Dead	(bool)	Battery fuel gauge status code 1
	BCS1	(bool)	Battery fuel gauge status code 2
	BCS2	(bool)	Battery fuel gauge status code 3
	BC_NPG	(bool)	Battery fuel gauge status code 4