

Options for Managing Filter-based PM Meta Data

AiVision offers two main approaches for handling the meta data (sampler volume, pressures, temps, etc) associated with filter-based samplers:

- Store the data as meta data as part of a single Sample record
- Store the data as additional parameters in AirVision

There are pros and cons to each, so let's review the approaches. Looking at the sample data editor, we can see that a single PM record can have meta data as part of the sample record:

Site	Parameter	Units	Sample Time	Value	Sample ID	Null Code	Qualifier Code	Frequency Code	Duration Code	Blank Type	Method Code	Creditable	Scheduled	Exclude from Reporting	Pickup Delay	Analysis Delay	Time Between Samples
01_KNOK	PM25_FRM	UG/M3	06/17/2012 0000	15				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	3 days
01_KNOK	PM25_FRM	UG/M3	06/18/2012 0000	10				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/19/2012 0000	5				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	ug	06/20/2012 0000	6				3 - EVERY 3RD D	7 - 24 HOURS	PREL - Filter					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/21/2012 0000	16				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	2 days
01_KNOK	PM25_FRM	UG/M3	06/22/2012 0000	8				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/23/2012 0000	3				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/24/2012 0000	7				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/25/2012 0000	12				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/26/2012 0000	12				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day
01_KNOK	PM25_FRM	UG/M3	06/27/2012 0000	19				3 - EVERY 3RD D	7 - 24 HOURS	-					1.5 days	2.67 days	1 day

Sample Details: End Time: 06/18/2012 0000, Analysis Time: 06/22/2012 0400, Barometric Press: 759.20000, Ambient Temp: 297.30000, Total Flow: 24.00000, Peak Area: [empty]

Extended Details: Barometric Press: 759.20000, Ambient Temp: 297.30000, Total Flow: 24.00000, Peak Area: [empty]

Annotations: [empty]

Note, however, that only the *average* pressure and temperature are stored, max and min values are not available as meta data- those must always be stored as additional parameters if the user wants to keep that data for other reports, graphing, etc. Note also that this approach assumes press/temp/flow kept only as the 24-hour sampler values, and not as hourly data potentially acquired via a data logger connected to the sampler.

When the user runs the calculator to get the final concentration, the calculator can draw from the meta data, or the user can request the data be queried from other parameters (“Populate from Site Averages”):

Particulate Sample Calculator

Site-Parameter: 01_KNOK : PM25_FRM

06/17/2012 0000

Calculation Input Parameters

Final Weight: 35.23110 (grams)

Initial Weight: 34.00030 (grams)

Sample Weight: 0.00080 (grams)

Time: 1440 (minutes)

Site Environment Parameters

Formula Type: ☒ Actual ☐ Theoretical ☐ Without P/T Correction (PM25)

Populate from Site Samples/Averages

Flow: 24.00000 (L/min)

Pressure: 759.20000 (mm Hg)

Temperature: 297.30000 (K)

Calculation

Calculate Sample: 15.10000

If the populate button is used, the system will seek either a sample record of the same time, or 24 x 1-hour averages from the same day, identifying the parameters using the parameter templates PMVOLUME, PMBARPRESS, and PMAMBTEMP.

This creates a problem if you want to have two co-located samplers at the same site, as one site cannot have two instances of the same parameter templates (for volume, press, temp). So, for a co-located site, we must either create a second site (e.g., NORTH_COL) and put all the parameters for the second sampler in that site, or forgo the parameter approach, and only keep the values in the meta data of the single PM parameter.

Also, note that the 'batch calculate' function in the Sample Data Editor (drag-select, left-click, "Recalculate Sample" can't do the "Populate" step, forcing the user to manually populate each record and calculate. However, this shortcoming can be worked around by having the File Import Template 'double-import' the average pressure and temperature (and flow) parameters, both as a parameter at the site, and in the meta data part of the record:

The screenshot shows the AirVision File Import Configuration window. The 'File Schema' section is active, showing the 'Template Name' as 'Partisol 2025 Filter Data_2Ximport'. The 'File Layout' section includes fields for 'Number of Header Lines' (0), 'Number of Footer Lines' (0), 'Minimum Number of Columns' (1), 'Field Delimiter' (Comma), and 'Sample Type' (Standard). The 'Parameter Information' section shows 'Match Parameter by Column Number' selected. The 'Data Type' section shows 'Sample / Non-Continuous' selected, with 'Duration Code' set to '7 - 24 HOURS' and 'Frequency Code' set to '3 - EVERY 3RD DAY'. The 'Existing Data' section has 'Reset Record And Overwrite' selected. The 'File Column Mapping' section is also visible, showing a table with columns for Column Number, Data Field, Parameter Template, Parse Format, and Flag Map. The table contains 38 rows of mappings, with several rows highlighted in red.

Column Number	Data Field	Parameter Template	Parse Format	Flag Map
1	Sample Identifier	PM2SLC		
5	Date		yyyy/MM/dd	
6	Time		HHmm	
11	Value	PMFLOWCOV		
12	Sample Total Flow	PM2SLC		
12	Value	PMVOLUME		
13	Value	PMMINTEMP		
14	Value	PMAMBTMP		
14	Sample Ambient Temp	PM2SLC		
15	Value	PMMAXTEMP		
19	Value	PMMINBP		
20	Value	PMBARPRESS		
20	Sample Barometric Press	PM2SLC		
21	Value	PMMAXBP		
38	Value	PM5AMPTIM		

So, the pros and cons of the two approaches can be summarized as follows:

	Store as Parameter	Store as Meta Data
Using reports and charts for average, min, max press, temp, flow	Yes	Not available
Using average press/temp in calculations	Yes, but 'fill' button must be used OR File Import template can be set to 'double-import'	Yes, can 'batch' calculate
Store min/max pressure, temp	Yes	No
Co-Located data in same site	No, must be separate site	Yes

So, in short, the general recommendation is to store as parameters and use the 'double import' approach, unless the customer has a particular objection to co-located samplers being represented as secondary sites in AirVision.