Calibration - PMX Span

How to apply Span with your Aeroqual Ranger | Dust (PMX sensor head).

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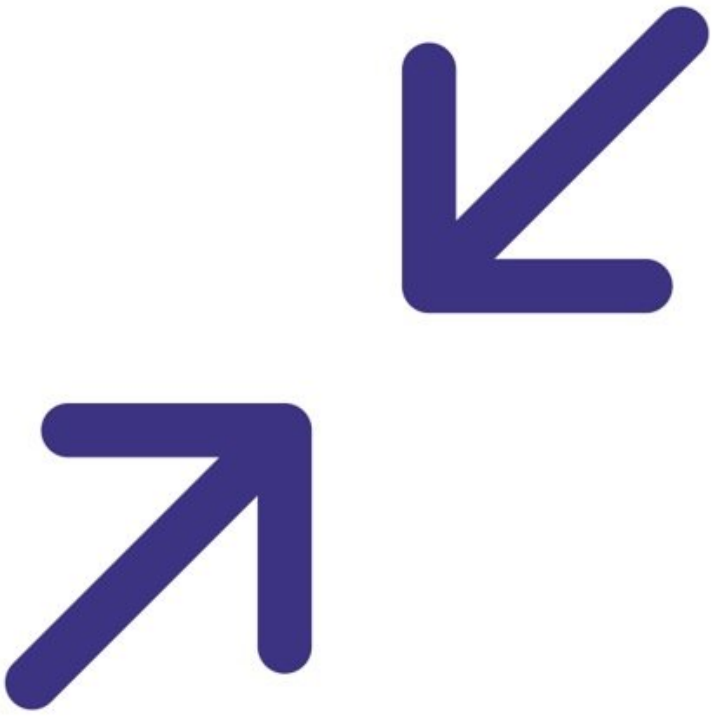


INTRODUCTION

Professionals may choose to apply a Span value for a specific project, area, and/or aerosol, using gravimetric analysis as their source of input.

This method may be used to increase the degree of accuracy of Ranger|Dust's concentration readings.

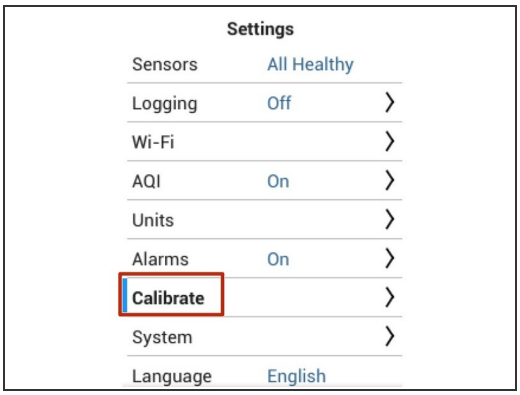
This is because the manufacturer calibrates these instruments using ISO 12103 Test Dust. Aerosols encountered in the field--having different optical properties from the Test Dust--will all give different readings.

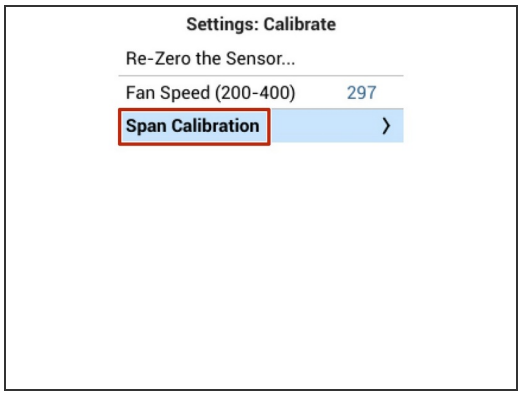
[video: https://www.youtube.com/watch?v=llfojs4fHww]

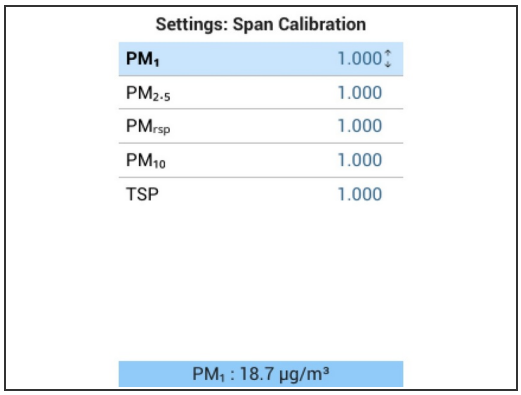
TOOLS:

- Gravimetric sampling devices (1)

Step 1 — Remove prior Span adjustments

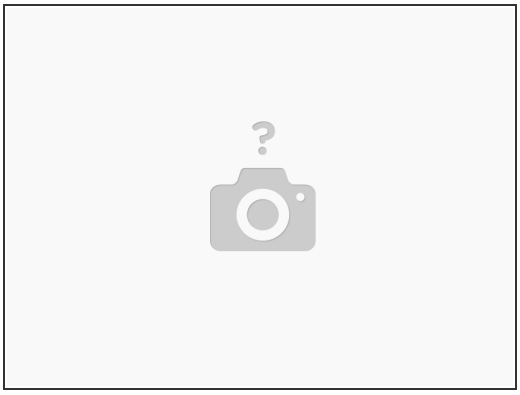






- Attach a PMX sensor head to Ranger and turn it on
- Enter the Settings menu by pressing and holding the **LEFT ARROW**
- Select the Calibrate submenu
- Select the Span Calibration menu
- Verify that the Span is set to 1.000 for all channels.

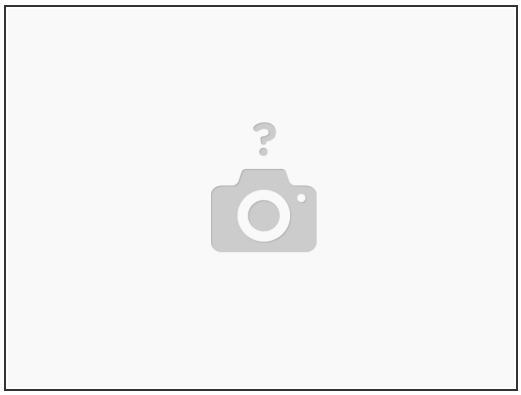
Step 2 — Conduct co-location sampling



Aeroqual recommends the use of a gravimetric sampling setup as your reference

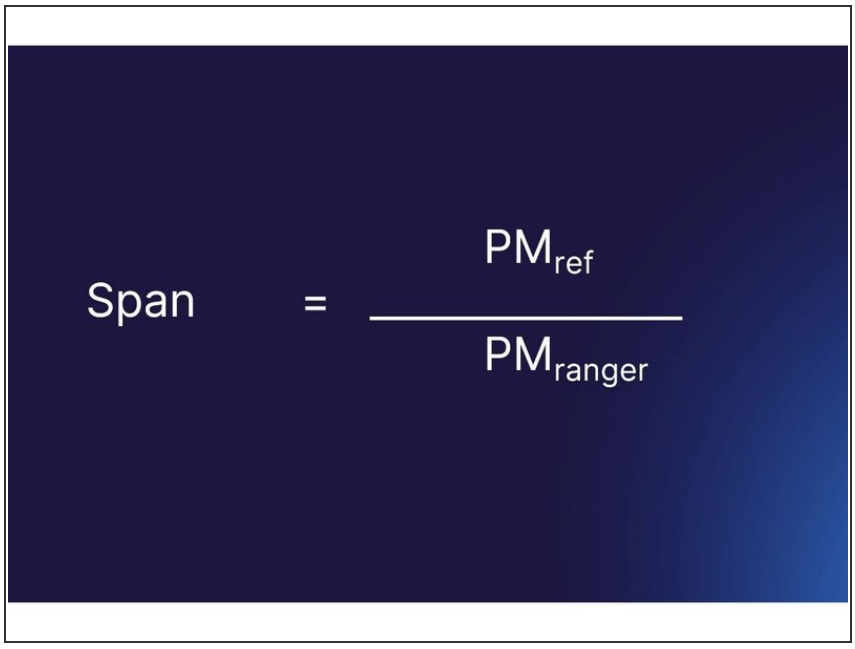
- Simultaneously begin and end the sampling periods of both Ranger|Dust and your chosen reference

Step 3 — Calculate average concentrations



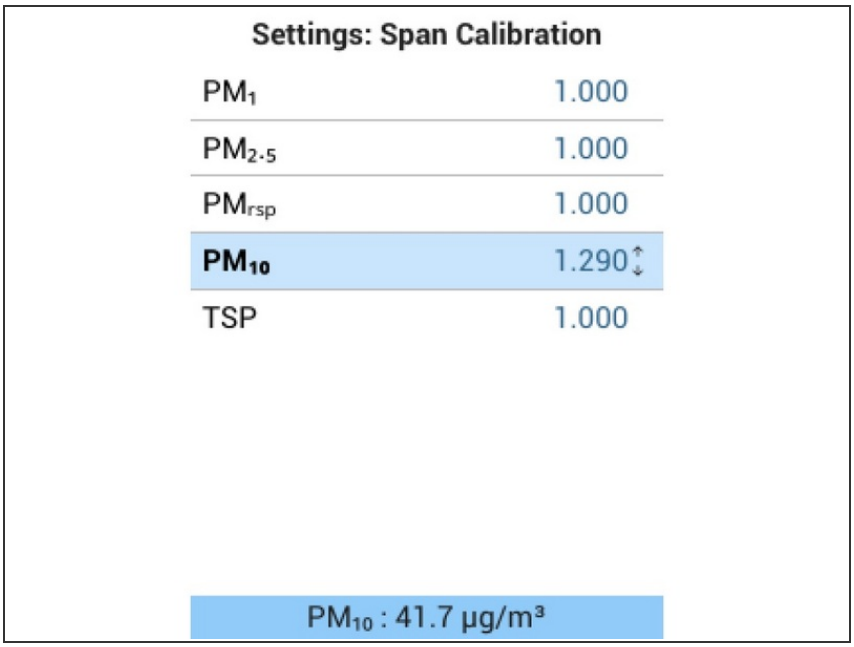
- Once your co-location sampling is completed, calculate the average mass concentration of your reference. This becomes **PM_{ref}**
- Next, calculate the average mass concentration of Ranger|Dust. This becomes **PM_{ranger}**

Step 4 — Calculate the Custom Calibration Factor



- Calculate the ratio of the PMref over PMranger. This becomes your **Span**

Step 5 — Apply the custom calibration factor



- Enter Settings and navigate to Calibrate>Span Calibration
- On the relevant channel, adjust the Span as the **Span** from the previous step
- Exit the Settings menu by pressing and holding the **LEFT ARROW**

ⓘ If you have applied a Span to some channels, but not others, you may notice the concentration readings for a smaller fraction channel exceeds the concentration readings of a larger fraction channel. For example, $PM_{2.5}$ > TSP.

Step 6 — Span moves with PMX sensor head

ⓘ If you remove the PMX sensor head from any Ranger base, and attach it to a different Ranger base, the Span will be retained

Your PMX sensor head will now give readings that account for a specific project, area, or aerosol.

