CleanAir Workshops series 023

Dust Monitoring Compliance

Thursday, September 14, 2023

Morning Program

9:00 Welcome

9:05 Overview and Updates of CDPH Regulatory and Community Air Monitoring Approaches
Michael Enos, CDPH

9:40 Regional and National Regulatory Overview
Brian Newgent and Claire Amin, Aeroqual

10:05 Monitoring Program Design and Data Analysis Considerations
Volker Schmid, CleanAir

10:30 **BREAK**

10:45 Intro to Site Contribution Analysis and Aeroqual's Site Contribution Tool
Connor Porter, Aeroqual

11:10 New Developments for Special Applications
Don Allen and Volker Schmid, CleanAir

11:35 Top 10 Support Questions
Don Allen, CleanAir, and Connor Porter, Aeroqual

12:00 **LUNCH**

COMMON TECHNICAL QUESTIONS

Modules
- What modules can be used in AQS1.

Calibration
- Suggested Calibration gases
- Equipment needed
  - AirCal 1000
  - O3 Generator
  - Calibration gases with regulators

What is a Hotswap?

Solar Setup
- Unit wattage
- Suggested solar array
- Suggested battery size vs run time.

Duplicate users in Cloud

Autozero Nephelometer

VOC Module
- Is the VOC module functioning?

AQS MODULES

Which modules can be used in AQS 1?

Carbon Monoxide	0-25ppm
Hydrogen Sulfide	0-10ppm
Methane	0-100ppm
Nitrogen Dioxide	0-500ppb
Ozone	0-500ppb
Sulfur Dioxide	0-10ppm
VOCL	0-500ppb
VOC	0-30ppm

VOC MODULE

Is the VOC Module Functioning?

VOC Modules have approximately 9 months of continual run time.

The most reliable method of verifying the functionality of any module is a challenge with a test gas. A bump test.
Isobutylene @ 10ppm for VOC

Aeroqual's Cloud software provides a Diagnostics screen where the SRB & SRG mV readings can be seen. If these fall under 50 the module is no longer functioning properly.

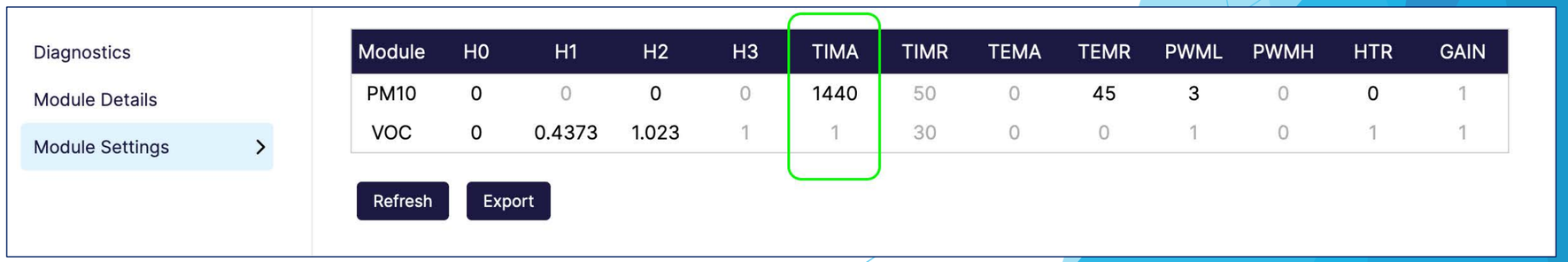
Time	VOC (ppm)	Raw (ppm)	SRB (mV)	SRG (mV)	Inlet
1:47 PM	0.70	0.452	418.142	382.733	Sample
1:46 PM	1.85	0.905	450.614	465.106	Sample
1:45 PM	3.34	2.961	365.905	424.612	Sample
1:44 PM	3.40	3.592	256.738	330.701	Sample
1:43 PM	1.24	3.339	119.069	187.879	Sample
1:42 PM	0.37	0.238	88.417	93.615	Sample
1:41 PM	0.10	0.315	76.603	83.465	Sample
1:40 PM	0.00	0.034	73.216	73.984	Sample
1:39 PM	0.00	0.014	72.633	72.942	Sample
1:38 PM	0.00	0.002	72.713	72.773	Sample

AUTOZERO NEPHELOMETER TIMING

The Nephelometer has a built-in autozero function—generally set to 1 day.

How to Change This?

On the right side the diagnostics screen you can select module settings. The TIMA field will contain a number relating to the minutes between autozeros. Runs approximately 5 minutes.



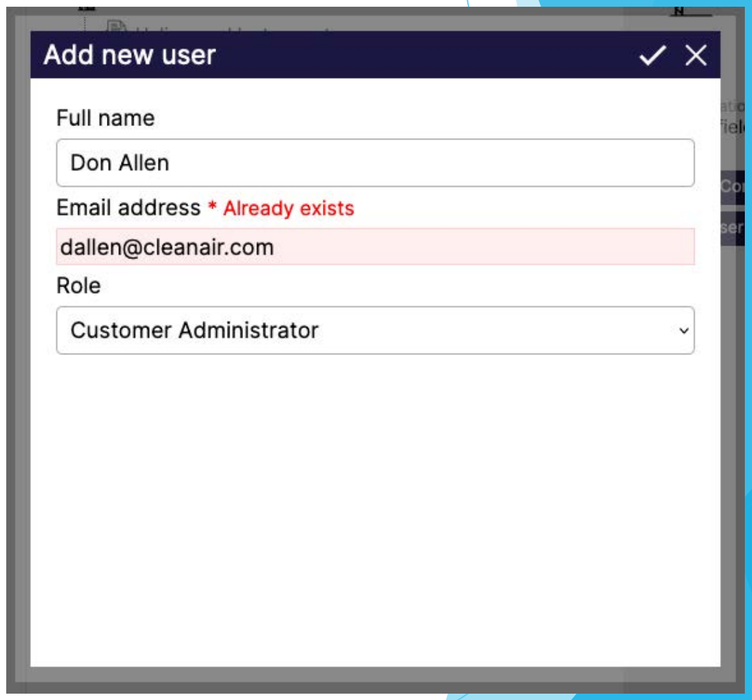
DUPLICATE USERS IN CLOUD

If your user is set up as a Company Admin, you will be able to create a new user. Sometimes you will encounter the Error:

Email address * Already exists

This error indicates that this Email address has been used to create an account. It could be under any account. Aeroqual only allows an email to have one instance in the cloud for security reasons.

The only way to add this user is to use a secondary Email.



CALIBRATION

Suggested Calibration Gases

AQM 65 gas module	O3	NO2	NOx	CO	SO2	VOC	H2S	CO2
Gas used for calibration	O3	NO2	NO2 or NO	CO	SO2	Isobutylene C_4H_8	H2S	CO2
Gas module measurement range	0 to 0.5 ppm	0 to 0.2 ppm	0 to 0.5 ppm	0 to 25 ppm	0 to 10.0 ppm	0 to 20 ppm	0 to 10 ppm	0 to 2000 ppm (0.2 %)
Span gas concentration for calibration	0.1 ppm	0.1 ppm	0.1 ppm	10.0 ppm	0.5 ppm	10.0 ppm	0.5 ppm	1000 ppm
Recommended Minimum, Maximum	0.08 - 0.150	0.05 - 0.150	0.05 - 0.2	5 - 15	0.2 – 1.5	5 - 15	0.2 – 1.5	
Recommended cylinder concentration when using AirCal 1000 or AirCal 8000 Recommended (ppm) Minimum, Maximum	Ozone is delivered by an Ozone generator	**20 ppm** 10 - 100	**20 ppm** 10 - 100	**1000 ppm** 500 - 5000	**20 ppm** 10 - 100	**1000 ppm** 500 - 5000	**20 ppm** 10 - 100	**1000 ppm** 500 - 1500
Recommended Gas cylinder from www.calgaz.com Part number:	N/A	20 ppm NO2 Balance AIR 8AL 58 liters C10 fitting A0446046	20 ppm NO2 Balance AIR 8AL 58 liters C10 fitting A0446046	1000 ppm CO Balance N2 6D 103 liters C10 fitting A0436734	20 ppm SO2 Balance N2 8AL 58 litres C10 fitting A0446071	Isobutylene 1000 ppm Balance Air 6D 103 litres A0436843	20 ppm H2S Balance N2 8AL 58 litres C10 fitting A0446004	1000 ppm CO2 Balance Air 6D 103 litres C10 fitting A0189932

Table 5-1 Recommended calibration cylinder concentrations. The recommended concentration is written in bold, the minimum and maximum recommend concentration are written in green in the table.

Note: The AQM 65 must be zero calibrated using zero air, N2 can not be used for zero calibration.

CALIBRATION

Equipment Needed

- Gases zero air and calibration
- Low-Level modules require a gas divider
- Ozone modules require an Ozone source

WHAT IS A HOTSWAP?

Aeroqual recommends factory calibration of Sensor Heads annually.

Old Model

- 30-45 business day turn around
- Poor customer experience

Aeroqual "Hot Swap"

- Sensor Heads within 10-14 months of initial purchase are eligible
- Cabinet Modules within 20-28 months of initial purchase are eligible.

Upon eligibility acceptance, a new Sensor will be drop-shipped to the supplied address. Arrival time depends on shipping. Sensors are newly-made and freshly-calibrated.

SOLAR SETUP

Calculating Wattage and Amp Hours

- The AQS1 uses maximum 30 watts.
- Batteries are generally in Amp hours.

Calculating Battery Amp Hours

Wh= Device W x Time
Wh = 30W x 1h
30Wh

Ah = Wh/V
Ah = 30Wh/12V
2.5Ah

One Day = 24h x 2.5Ah
One Day = 60 Ah

SOLAR SETUP

Sizing Arrays and Batteries

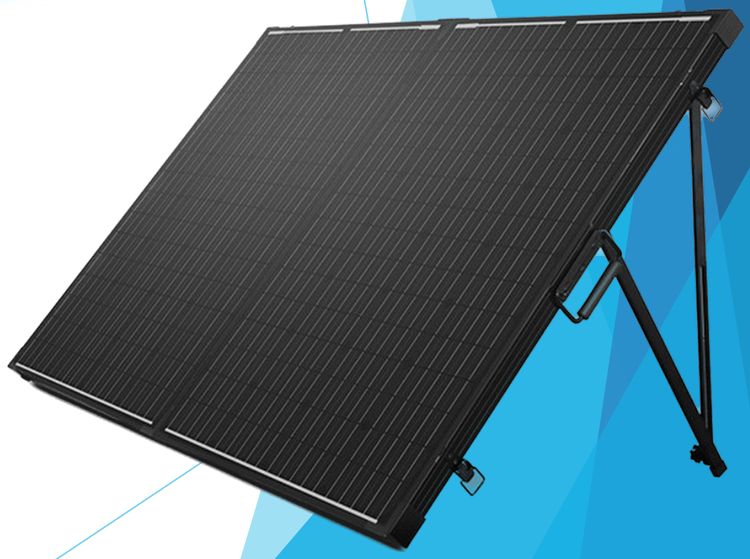
We set our solar systems to run four days with no sun.

Battery sized at 240Ah minimum.

One-Day Battery: 60Ah

We size our solar panel arrays at 400w.

Setup works in most of North America.



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Afternoon Program

1:00 Hands-On Sessions (20-min. Rotating Stations)
1:10-1:30 1:35-1:55 2:00-2:20
2:30 Closing Remarks
2:40 Adjourn

Hands-On Sessions

Session 1: System Setup, Software Configuration and Data Access
Session 2: Module Calibration, Module Exchange, and Hot-Swapping
Session 3: Troubleshooting Secrets and Best Practices
(Flow Rate and Leak Checks, Filter and Pump Exchanges)