



Maryland
Department of
the Environment

S02 AirPointer Tips and Tricks

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MARAMA Monitoring Workshop

November, 21 2019



SO₂ Air Monitor - The Airpointer

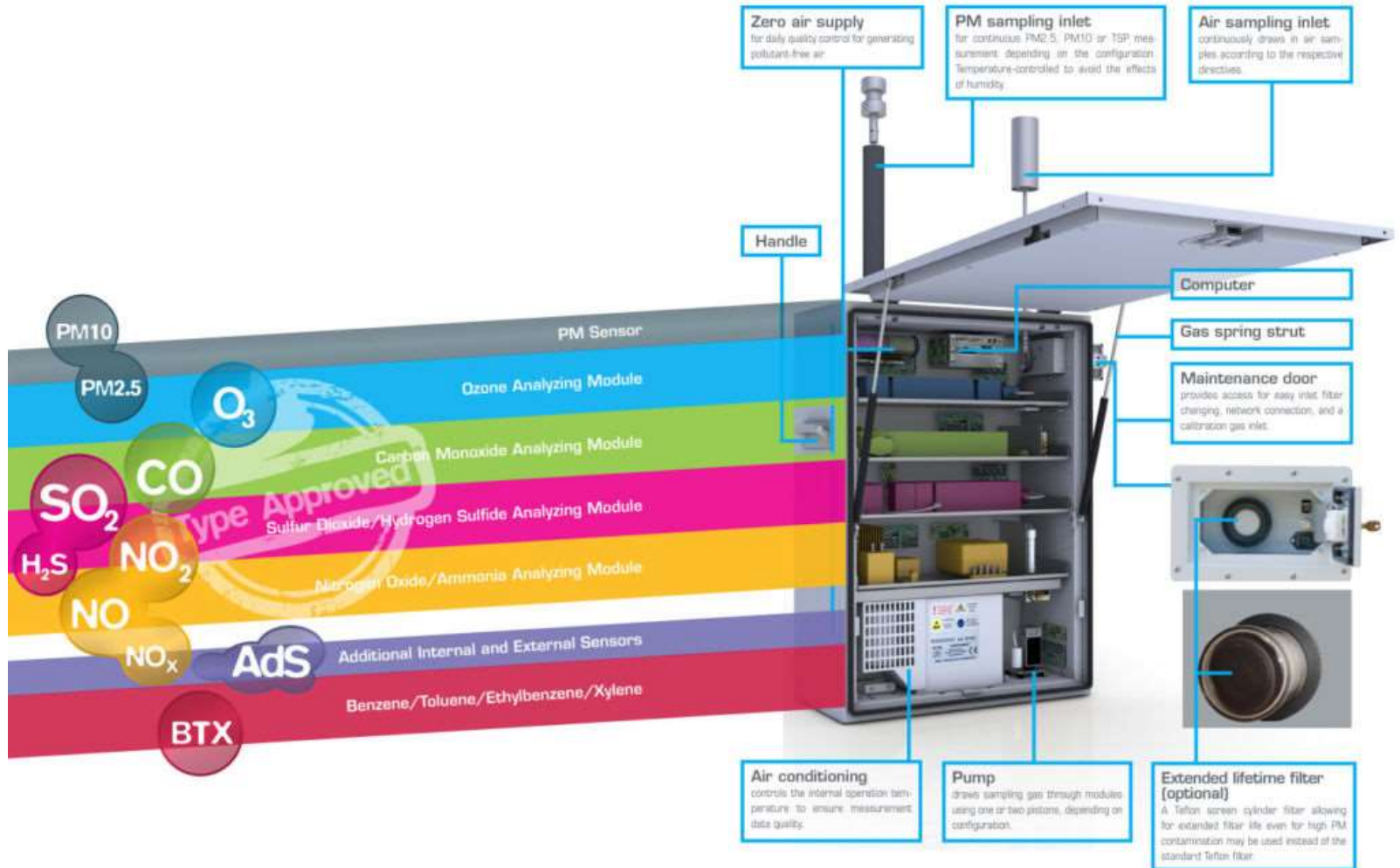




Exhibit A



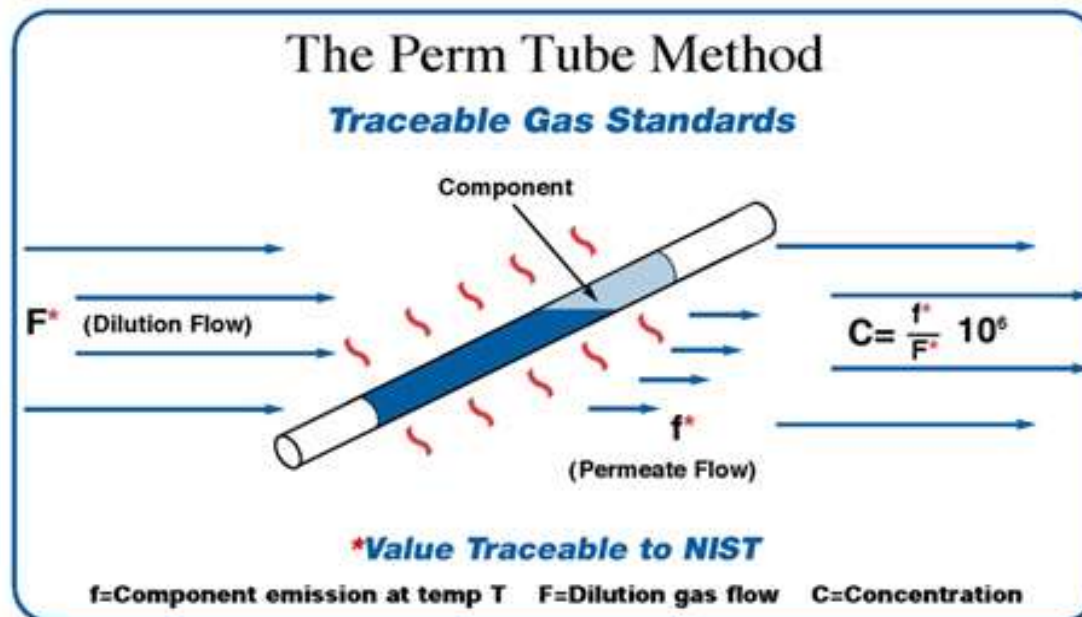
Pasadena Air Monitoring Site - Riviera Beach
Elementary School 8515 Jenkins Road





Perm Tube

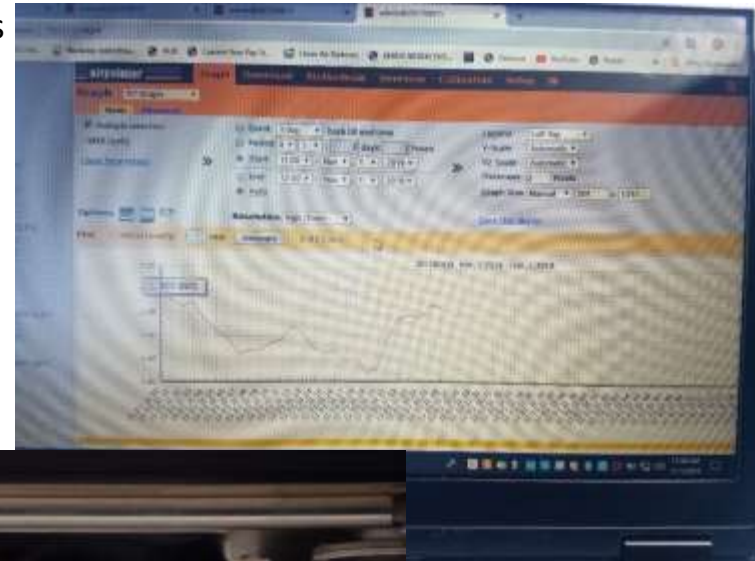
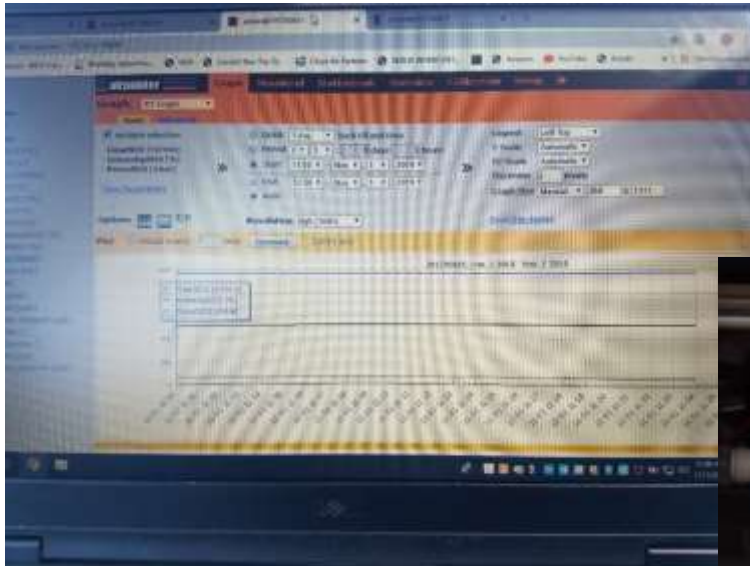
- Internal Perm Tube is used to run nightly zero/span checks
- Upon Initial Setup it was found that the Perm Tube was defective and causing failures. Possibly cracked.
- Unit does not have a way of tracking the Dilution Flow to the Perm Oven, just goes by a set value not actual flow





Interfacing with Unit

- Direct connection from Laptop onsite
- Remote IP connection to software from office
- Mostly compatible with the Envidas Ultimate software for datalogging purposes
- Proprietary software allows access to a lot of internal diagnostics
 - Temperatures
 - Flows (Minus Perm Tube Dilution)
 - Pressures



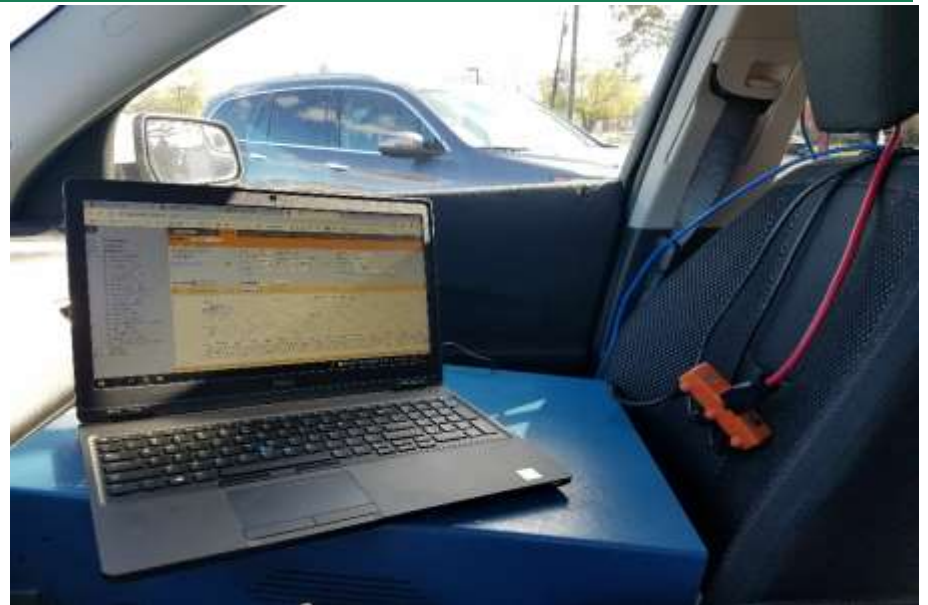


PC and Calibration

- All audit/calibration equipment must be brought to the site.
- Ambilabs is trying to incorporate a Dilution Calibrator/Zero Air Generator into the unit to eliminate the need for external equipment and the Perm Tube.....extremely initial stages!!!
- It takes a 30' insulated cal line to reach from the cal equipment (inside a vehicle) to the audit port on the Airpointer
- Due to the length of the line, there needs to be ~1 hour of conditioning before stable zero readings can be seen on the analyzer
- Line then needs ~30 minutes of conditioning with 100ppb SO₂ before dropping down to the MDE Precision Point of 40ppb. Would take hours to reach this point if line wasn't conditioned.
- If using TAPI T700U Dilution Calibrator, the Vent Port needs to be capped as the unit vents thru the Sample In, much like a TAPI NO_y analyzer



PC and Calibration Procedures



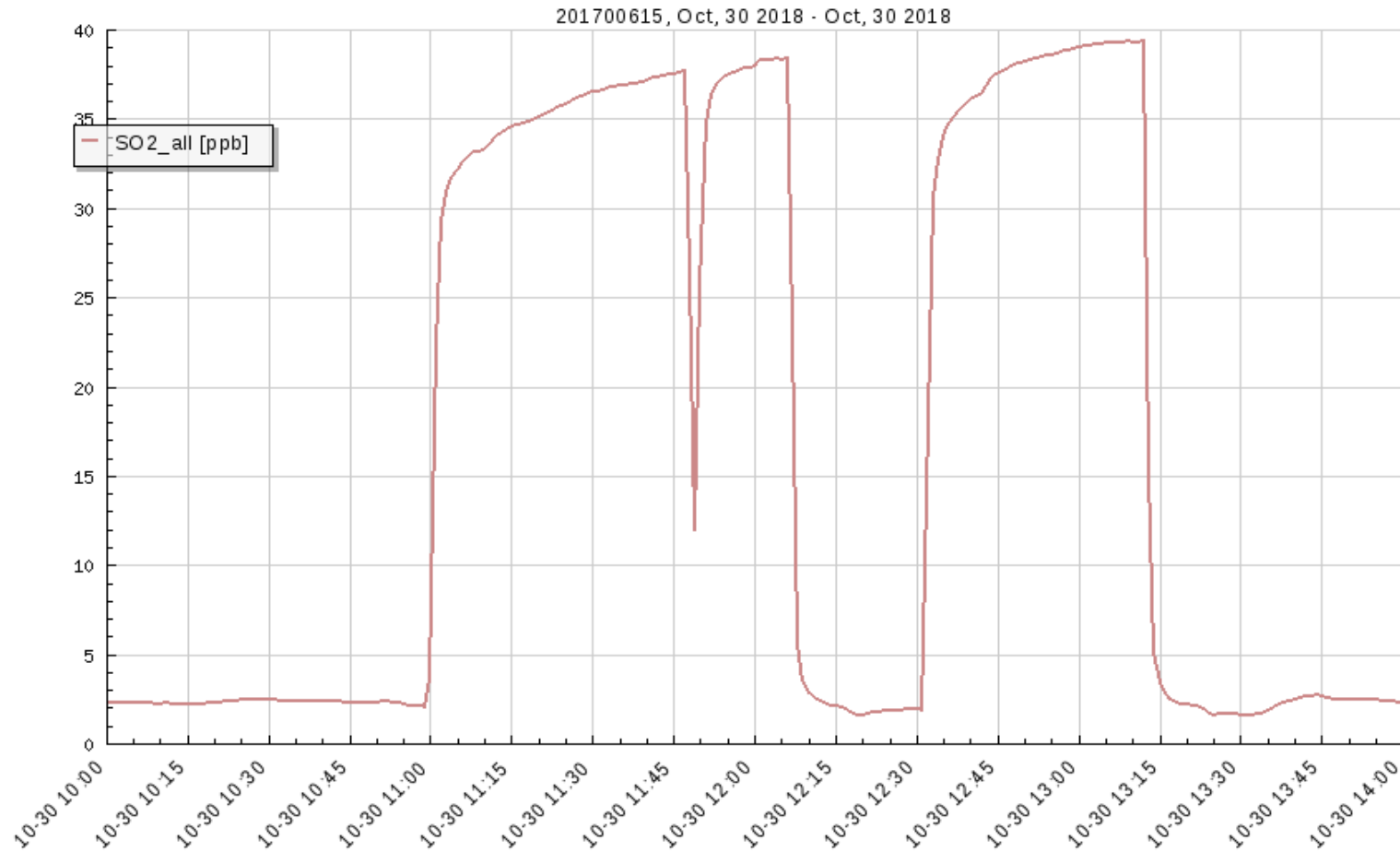


PC and Calibration Procedures Cont.





Short vs. Long Line PCs

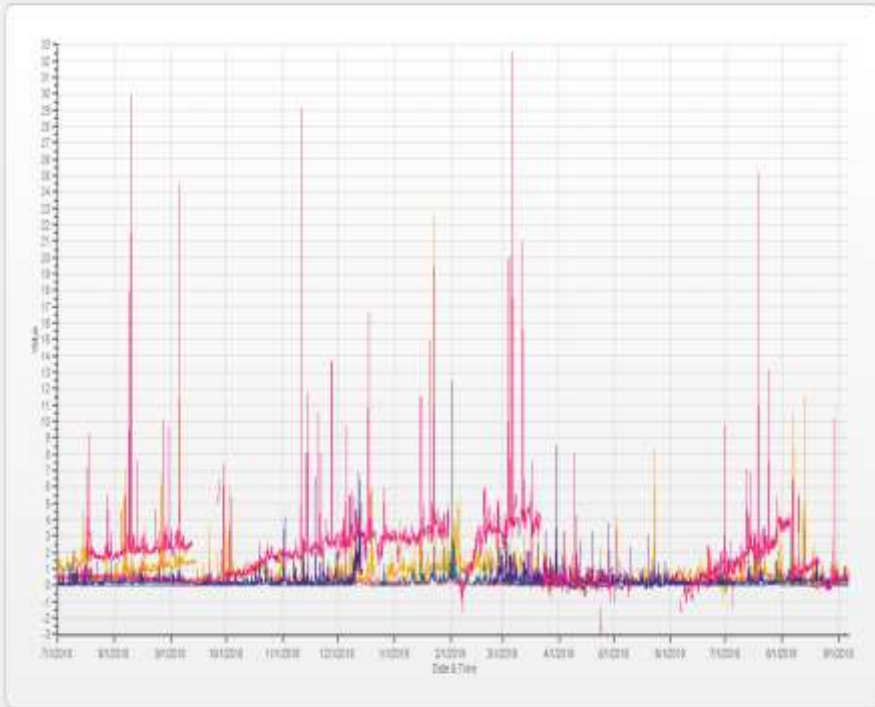




Trials and Tribulations

- Zero drift is a common issue

Group: SO2 Periodicity: 7/12/2019 12:00 AM-8/6/2019 11:00 PM Type: AVG 1hr



EBEX(SO2) HORN POINT(SO2) HOWARD U.(SO2) PNEY PLAIN(SO2) Fines Beach(SO2)

Report Type: Calibration Avg Type: Calc_ZPoints
Date Time: 08/20/19 Time Base: None

Date	Monitor	Units	Zero					Span					Result			
			ZRef	ZMeas	ZD#(%FS)	ZD#Last	ZStd	SRef	SMeas	SD#(%FS)	SD#(REF)	SD#Last(%)	SSId	Zero	Factor	Status
8/12/2019 1:27 AM	SO2	ppb	0.0	3.2	0.64	0.2	No Data	124.0	125.2	0.20	1.0	-0.1	No Data	3.2	1.015	Valid
8/20/2019 1:27 AM	SO2	ppb	0.0	3.6	0.73	-0.4	No Data	124.0	124.7	0.20	0.5	0.4	No Data	3.6	1.024	Valid
8/30/2019 1:27 AM	SO2	ppb	0.0	3.7	0.74	-0.1	No Data	124.0	125.8	0.20	1.4	-0.9	No Data	3.7	1.015	Valid
8/4/2019 1:27 AM	SO2	ppb	0.0	3.6	0.73	0.1	No Data	124.0	126.0	0.20	1.6	-0.2	No Data	3.6	1.012	Valid
8/5/2019 1:27 AM	SO2	ppb	0.0	4.1	0.83	-0.5	No Data	124.0	126.1	0.20	1.7	-0.1	No Data	4.1	1.016	Valid
8/6/2019 1:27 AM	SO2	ppb	0.0	0.0	0.00	4.1	No Data	124.0	122.8	0.20	-0.9	2.6	No Data	0.0	1.009	Valid
8/7/2019 1:27 AM	SO2	ppb	0.0	0.5	0.11	-0.5	No Data	124.0	123.8	0.20	-0.1	-0.7	No Data	0.5	1.006	Valid
8/7/2019 6:00 AM	SO2	ppb	0.0	1.0	0.20	-0.5	No Data	124.0	—	0.00	No Data	No Data	No Data	1.0	0.000	Invalid
8/8/2019 1:27 AM	SO2	ppb	0.0	1.2	0.24	-0.2	No Data	124.0	124.3	0.20	0.2	—	No Data	1.2	1.007	Valid
8/9/2019 1:27 AM	SO2	ppb	0.0	0.6	0.12	0.6	No Data	124.0	123.1	0.20	-0.7	0.9	No Data	0.6	1.012	Valid
8/10/2019 1:27 AM	SO2	ppb	0.0	0.7	0.14	-0.1	No Data	124.0	122.3	0.20	-1.3	0.6	No Data	0.7	1.019	Valid
8/11/2019 1:27 AM	SO2	ppb	0.0	0.8	0.16	-0.1	No Data	124.0	121.7	0.20	-1.8	0.5	No Data	0.8	1.025	Valid
8/12/2019 1:27 AM	SO2	ppb	0.0	0.6	0.12	0.2	No Data	124.0	121.9	0.20	-1.6	-0.1	No Data	0.6	1.022	Valid
8/13/2019 1:27 AM	SO2	ppb	0.0	0.8	0.16	-0.2	No Data	124.0	122.8	0.20	-0.9	-0.6	No Data	0.8	1.016	Valid
8/14/2019 1:27 AM	SO2	ppb	0.0	1.1	0.22	-0.3	No Data	124.0	123.9	0.20	0.0	-0.8	No Data	1.1	1.009	Valid
8/14/2019 10:50 AM	SO2	ppb	0.0	1.0	0.21	0.1	No Data	124.0	—	0.00	No Data	No Data	No Data	1.0	0.000	Invalid
8/14/2019 10:55 AM	SO2	ppb	0.0	1.1	0.23	-0.1	No Data	124.0	—	0.00	No Data	—	No Data	1.1	0.000	Invalid
8/14/2019 11:00 AM	SO2	ppb	0.0	1.2	0.25	-0.1	No Data	124.0	—	0.00	No Data	—	No Data	1.2	0.000	Invalid
8/14/2019 12:50 PM	SO2	ppb	0.0	1.0	0.20	0.2	No Data	124.0	—	0.00	No Data	—	No Data	1.0	0.000	Invalid
8/14/2019 12:55 PM	SO2	ppb	0.0	1.1	0.22	-0.1	No Data	124.0	—	0.00	No Data	—	No Data	1.1	0.000	Invalid
8/14/2019 1:00 PM	SO2	ppb	0.0	1.0	0.21	0.1	No Data	124.0	—	0.00	No Data	—	No Data	1.0	0.000	Invalid
8/15/2019 1:27 AM	SO2	ppb	0.0	1.1	0.23	-0.1	No Data	124.0	122.9	0.20	-0.8	—	No Data	1.1	1.018	Valid
8/16/2019 1:27 AM	SO2	ppb	0.0	1.1	0.23	0.0	No Data	124.0	123.3	0.20	-0.5	-0.2	No Data	1.1	1.015	Valid
8/17/2019 1:27 AM	SO2	ppb	0.0	1.2	0.24	-0.1	No Data	124.0	124.8	0.20	0.6	-1.1	No Data	1.2	1.003	Valid
8/18/2019 1:27 AM	SO2	ppb	0.0	1.6	0.32	-0.4	No Data	124.0	124.8	0.20	0.7	-0.1	No Data	1.6	1.006	Valid
8/19/2019 1:27 AM	SO2	ppb	0.0	1.5	0.30	0.1	No Data	124.0	124.6	0.20	0.5	0.1	No Data	1.5	1.006	Valid
8/20/2019 1:27 AM	SO2	ppb	0.0	1.5	0.30	0.0	No Data	124.0	124.3	0.20	0.2	0.2	No Data	1.5	1.009	Valid
8/21/2019 1:27 AM	SO2	ppb	0.0	1.4	0.28	0.1	No Data	124.0	124.2	0.20	0.1	0.0	No Data	1.4	1.009	Valid



Trials and Tribulations

- One issue with Envista ARM and Airpointer Communications is the reporting of the nightly zero/span checks.
- Maintaining proper temperatures on the PC/Audit equipment during hot or cold weather is a challenge.

SO2(ppb) Calibration: Rivers Beach Monthly: 11/2019 Type: Calc_Points - Envista Air Resources Manager

Report Type: Calibration Avg Type: Calc_Points
Date Time: 11/20/19 Time Base: None

Date	Monitor	Units	Zero					Span					Zero	Factor	Status	
			ZRef	ZMean	ZD(%FSD)	ZD(Last)	ZStd	SRef	SMean	SDW(%FSD)	SDW(REF)	SDW(Last)				SStd
11/1/2019 1:27 AM	SO2	ppb	0.0	0.0	0.18	-0.1	No Data	124.0	118.8	0.21	-4.1	0.7	No Data	0.9	1.051	Valid
11/1/2019 11:50 PM	SO2	ppb	0.0	0.2	0.05	0.7	No Data	124.0	—	0.00	No Data	No Data	No Data	0.2	0.000	Invalid
11/1/2019 11:55 PM	SO2	ppb	0.0	0.4	0.08	-0.2	No Data	124.0	—	0.00	No Data	No Data	No Data	0.4	0.000	Invalid
11/2/2019 12:06 AM	SO2	ppb	0.0	0.4	0.08	0.0	No Data	124.0	—	0.00	No Data	No Data	No Data	0.4	0.000	Invalid
11/2/2019 1:27 AM	SO2	ppb	0.0	0.0	0.01	0.4	No Data	124.0	113.3	0.21	-8.8	—	No Data	0.0	1.095	Valid
11/2/2019 1:50 PM	SO2	ppb	0.0	0.3	0.06	-0.3	No Data	124.0	—	0.00	No Data	No Data	No Data	0.3	0.000	Invalid
11/2/2019 1:55 PM	SO2	ppb	0.0	0.4	0.09	-0.1	No Data	124.0	—	0.00	No Data	No Data	No Data	0.4	0.000	Invalid
11/2/2019 2:00 PM	SO2	ppb	0.0	0.4	0.08	0.0	No Data	124.0	—	0.00	No Data	No Data	No Data	0.4	0.000	Invalid
11/3/2019 1:27 AM	SO2	ppb	0.0	0.4	0.08	0.0	No Data	124.0	114.0	0.21	-7.9	—	No Data	0.4	1.090	Valid
11/4/2019 1:27 AM	SO2	ppb	0.0	0.0	-0.01	0.4	No Data	124.0	112.2	0.22	-9.4	1.5	No Data	0.0	1.103	Valid
11/5/2019 1:27 AM	SO2	ppb	0.0	0.2	0.05	-0.2	No Data	124.0	114.0	0.21	-8.0	-1.3	No Data	0.2	1.089	Valid
11/6/2019 1:27 AM	SO2	ppb	0.0	0.4	0.08	-0.2	No Data	124.0	115.2	0.21	-7.0	-0.9	No Data	0.4	1.079	Valid
11/7/2019 1:00 AM	SO2	ppb	0.0	0.2	0.05	0.2	No Data	124.0	—	0.00	No Data	No Data	No Data	0.2	0.000	Invalid
11/7/2019 1:27 AM	SO2	ppb	0.0	0.3	0.06	-0.1	No Data	124.0	113.1	0.21	-8.7	—	No Data	0.3	1.089	Valid
11/7/2019 3:50 PM	SO2	ppb	0.0	0.0	0.18	-0.5	No Data	124.0	—	0.00	No Data	No Data	No Data	0.0	0.000	Invalid
11/7/2019 3:55 PM	SO2	ppb	0.0	0.7	0.15	0.1	No Data	124.0	—	0.00	No Data	No Data	No Data	0.7	0.000	Invalid
11/7/2019 4:00 PM	SO2	ppb	0.0	0.7	0.14	0.0	No Data	124.0	—	0.00	No Data	No Data	No Data	0.7	0.000	Invalid
11/8/2019 1:27 AM	SO2	ppb	0.0	0.1	0.03	0.6	No Data	124.0	114.6	0.21	-7.5	—	No Data	0.1	1.083	Valid
11/9/2019 1:27 AM	SO2	ppb	0.0	-0.7	-0.14	0.8	No Data	124.0	110.6	0.22	-10.7	3.2	No Data	-0.7	1.113	Invalid
11/9/2019 11:50 AM	SO2	ppb	0.0	-0.5	-0.10	0.2	No Data	124.0	—	0.00	No Data	No Data	No Data	-0.5	0.000	Invalid
11/9/2019 11:55 AM	SO2	ppb	0.0	-0.4	-0.09	-0.1	No Data	124.0	—	0.00	No Data	No Data	No Data	-0.4	0.000	Invalid
11/9/2019 12:00 PM	SO2	ppb	0.0	-0.5	-0.10	0.1	No Data	124.0	—	0.00	No Data	No Data	No Data	-0.5	0.000	Invalid
11/10/2019 1:27 AM	SO2	ppb	0.0	-0.3	-0.05	-0.3	No Data	124.0	112.7	0.21	-8.1	—	No Data	-0.2	1.097	Valid
11/11/2019 1:27 AM	SO2	ppb	0.0	-0.4	-0.09	0.2	No Data	124.0	113.3	0.21	-8.8	-0.4	No Data	-0.4	1.089	Valid
11/12/2019 1:27 AM	SO2	ppb	0.0	0.3	0.06	-0.7	No Data	124.0	119.7	0.20	-3.4	-5.1	No Data	0.3	1.038	Valid

