

# Collection of In-stack NO<sub>2</sub>/NO<sub>x</sub> Ratio Information

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*Dan Dix*

*Technical Leader*

[ddix@all4inc.com](mailto:ddix@all4inc.com)

*(610) 933-5246, extension 18*



# Introduction

- The collection of in-stack  $\text{NO}_2/\text{NO}_x$  data for use in AERMOD's OLM and PVMRM option has become more important since the promulgation of the new 1-hour  $\text{NO}_2$  NAAQS.
- Many facilities are currently collecting  $\text{NO}_x$  data using CEMS
- CEMS collecting  $\text{NO}_x$  data use the *Chemiluminescence* method which also measures NO and  $\text{NO}_2$ .

# Agenda

- ❑ Project Overview
- ❑ Current Setup
- ❑ Equipment
- ❑ Conclusions and Additional Considerations
- ❑ Questions?

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# Project

- Conducting exploratory 1-hour NO<sub>2</sub> and SO<sub>2</sub> NAAQS air quality modeling for a cement facility.
- NO<sub>2</sub> NAAQS results showed issues when using Tier III method with OLM and default in-stack NO<sub>2</sub>/NO<sub>x</sub> ratio (0.5).
- Determine site specific in-stack NO<sub>2</sub>/NO<sub>x</sub> ratio data using existing NO<sub>x</sub> monitor.

# Current Setup

- Thermo Scientific Model 42i  
Chemiluminescence NO-NO<sub>2</sub>-NO<sub>x</sub>
- System currently collects NO<sub>x</sub> data on their DAHS and PLCs.

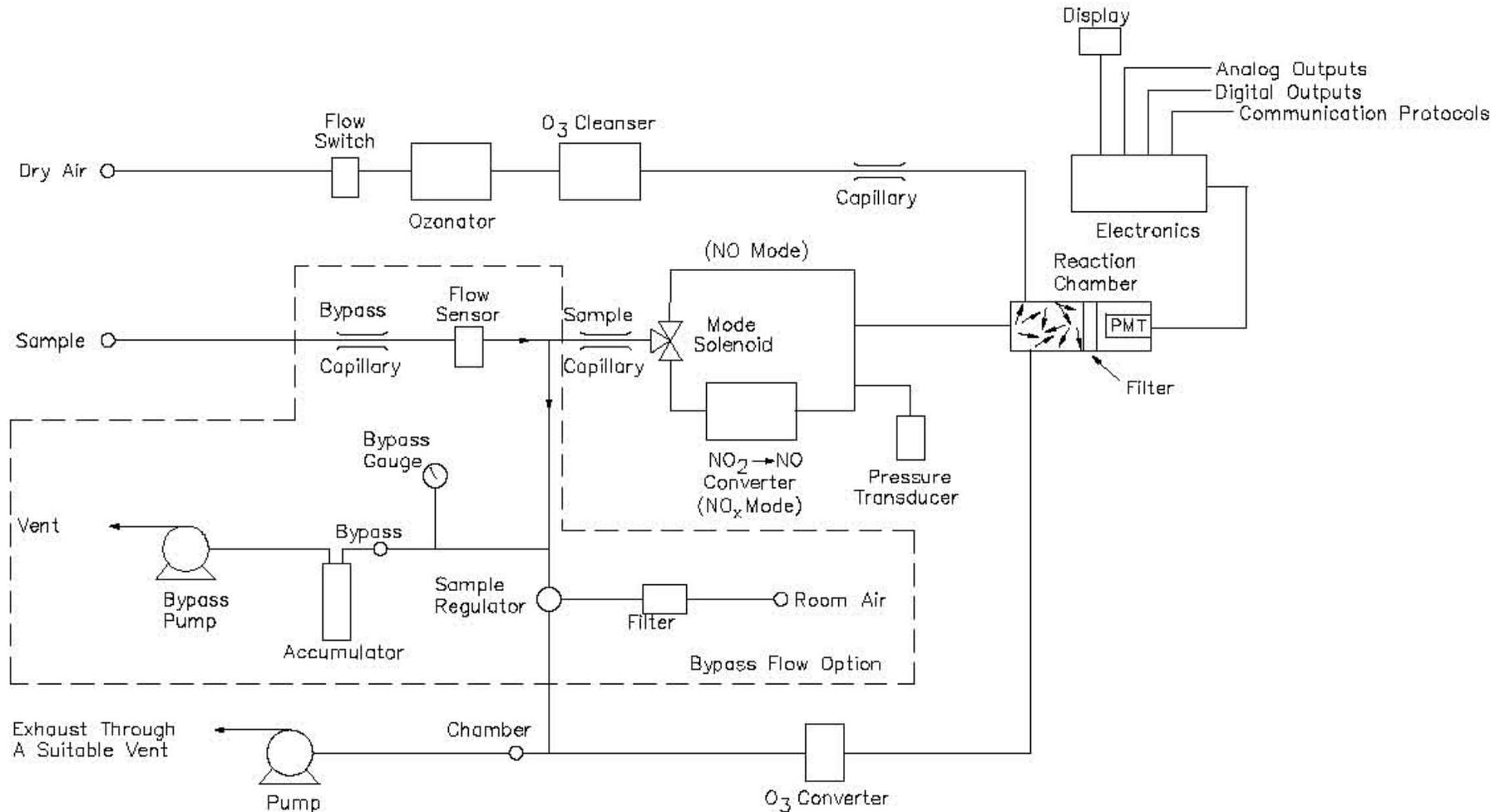
# Chemiluminescence

- The Chemiluminescence process:



- NO and O<sub>3</sub> react to produce a characteristic luminescence with an intensity linearly proportional to NO concentrations.

# 42i Flow Schematic

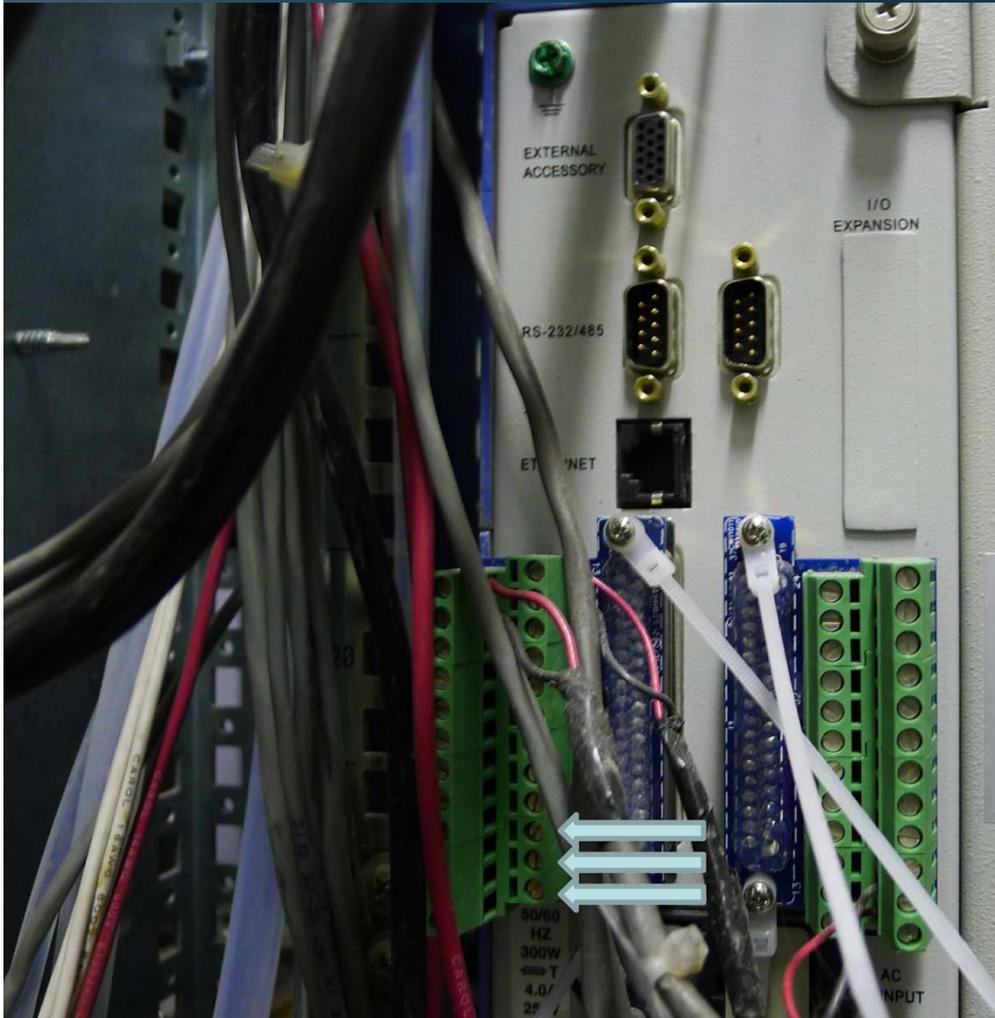


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# Collecting Data

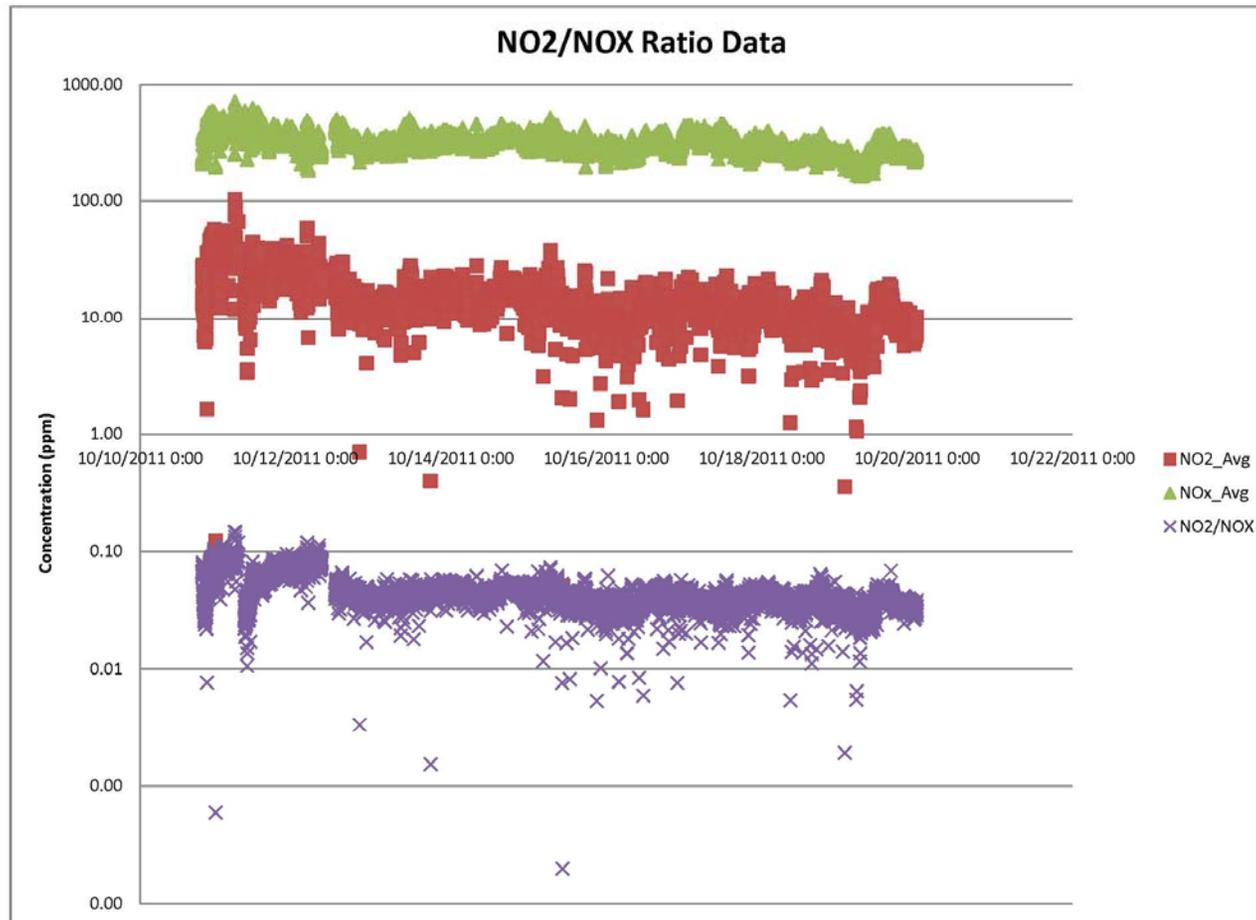
- It was easier and more cost effective to install a temporary datalogger than set up NO<sub>2</sub> readings in their current DAHS and PLC Systems.
- A Campbell Scientific CR1000 datalogger was hooked up to unused ports on the 42i and programmed to take 1 minute readings of NO, NO<sub>2</sub>, and NO<sub>x</sub>.

# Equipment Setup



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# Results



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# Conclusions and Considerations

- ❑ Cost effective and simple (less invasive) way to collect in-stack NO<sub>2</sub>/NO<sub>x</sub> information for use modeling NO<sub>2</sub> using AERMOD's OLM or PVMRM options.
- ❑ Many facilities currently operate NO<sub>x</sub> CEMS under a variety of programs.
- ❑ DAHS systems could also be set up to collect this information.
- ❑ If no NO<sub>x</sub> CEMS is in place this data can also be collected during NO<sub>x</sub> testing.
- ❑ Protocol Considerations
  - Statistical Analysis
  - QA/QC

# Questions?

Dan Dix

[ddix@all4inc.com](mailto:ddix@all4inc.com)

(610) 933-5246, extension 18  
2393 Kimberton Road  
Kimberton, PA 19442

All4 Inc.

[www.all4inc.com](http://www.all4inc.com)

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