

The **M**ulti-Point **A**utomated **S**ampling System

The solution for fast and efficient NOx testing applications:

- Ammonia Injection Balancing
- SCR/SNCR Optimization
- Catalyst Management
- Boiler Optimization

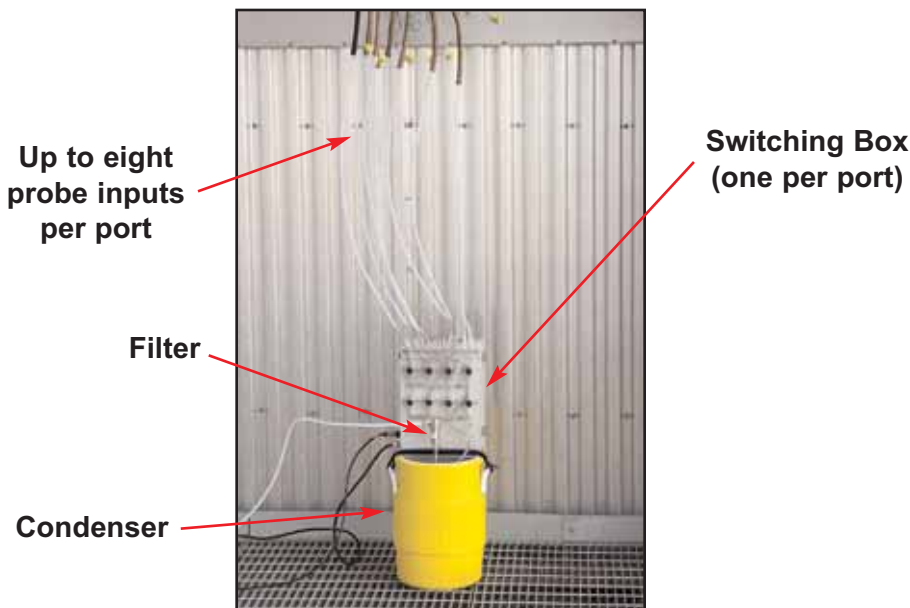


The **MASS** Automated Sampling System

How It Works

The **MASS** uses a series of automated 8-point PLC-controlled sample selection modules that direct the flue gas to mobile CEMs for NO_x, O₂, CO₂ and/or CO analysis.

Large capacity moisture condensers minimize the sampling delays due to particulate plugging and measurement error associated with NO₂ scrubbing inherent to other systems.



*The **MASS** can be configured to measure up to a 128-point sample grid in less than 11 minutes.*

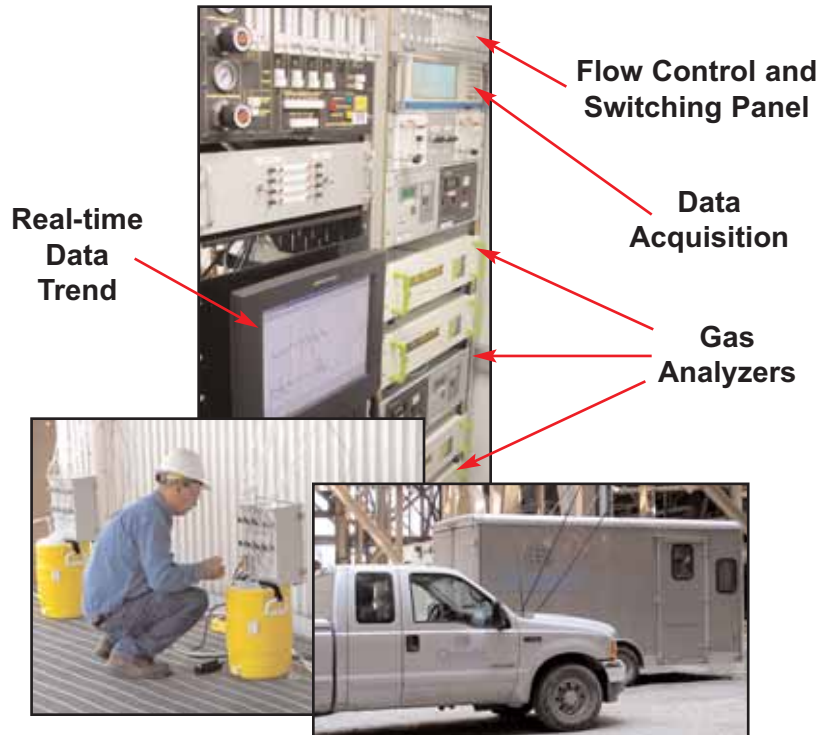
The **MASS** Advantage

- PLC-controlled point-by-point sampling
- Fast cycle time
- Maintenance-free valves
- No particulate plugging
- Eliminates problems with NO₂ scrubbing
- Real time graphical data

System Configuration

Clean Air Engineering can perform flue gas profiling for diagnostic and optimization purposes faster than traditional sampling methods using the **MASS**. The heart of the system is its ability to rapidly profile the flue gas distribution over a large measurement area.

The system can be configured to sequentially sample and analyze NO_x (NO & NO₂), O₂, CO₂ and CO from one to four banks of analyzers depending on sampling point and time requirements.

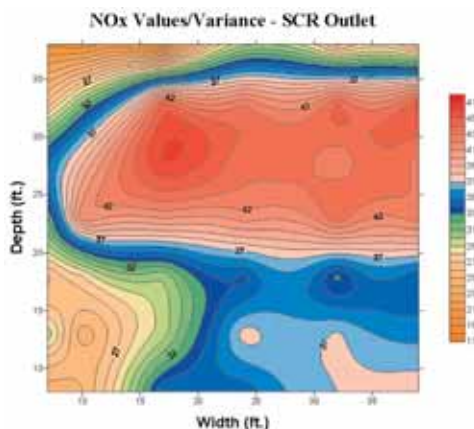


System Sampling Time

The standard setup allows four groups of eight sample points (32 total) to be sequentially sampled by one bank of analyzers at 20 seconds per point, for a total of 10.6 minutes. Even if 128 total points are sampled to four banks of analyzers, it would still take only 10.6 minutes to sample all 128 points.

32 points per bank of analyzers
128 points per four banks of analyzers

Total Traverse Time	Sample Time / Point	Purge Time / Point
8 Min.	15 Sec.	45 Sec.
10.6 Min.	20 Sec.	1 Min.
16 Min.	30 Sec.	1.5 Min.
21.3 Min.	40 Sec.	2 Min.



Data Presentation

The data acquisition and analysis software displays the point-by-point emissions concentrations in real-time with concentration profiles produced within minutes at the completion of each traverse for evaluation.

CLEAN AIR ENGINEERING

THE CLEANAIR ADVANTAGE

The strength of CleanAir's organization is its solid base of professionals with boiler and air emissions testing, combustion, flue gas cleaning, engineering, regulatory, and analytical experience; all committed to developing and implementing cost effective solutions to air pollution and combustion problems of fossil fuel, MSW and hazardous waste fired boilers.

In addition, CleanAir has extensive equipment resources maintained through CleanAir Instrument Rental and CleanAir Express. Not only do we provide rental of state-of-the-art monitoring instrumentation, we also have in-house manufacturing capabilities for customized sampling equipment such as HVT probes and multi-point sampling grids. For over 30 years, by delivering more than data, we have provided high value to our customers by turning environmental costs into bottom line profits.



ENVIRONMENTAL CONSULTING

- Environmental Strategic Planning
- Permitting and Permit Implementation
- Compliance Reporting
- Audits / Operational Review
- CAM Plans
- Training



PROCESS ENGINEERING

- APC Equipment Specification, Optimization and Troubleshooting
- Combustion / Boiler Tuning
- Emissions Reduction Strategy
- Sequential Process Optimization
- Fuel Switching Studies



CLEANAIR INSTRUMENT RENTAL

- Continuous Emission Monitoring Systems
- Calibration Gases
- Data Acquisition
- Air Monitoring Instruments
- Instrument Repair



CLEANAIR EXPRESS EQUIPMENT SALES

- EPA Reference Method Test Equipment for Particulate, SO₃ and Mercury
- Emission Measurement Supplies
- Test Method and Equipment Training
- Sample Gas Delivery Systems
- Portable Combustion Analyzers



MEASUREMENT AND ANALYTICAL SERVICES

- Stack Testing
- Emissions Inventories
- Performance / Guarantee Testing
- Trial Burns
- Onsite GC / FTIR Analysis
- Particle Characterization / Resistivity

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