Ammonia Emissions Monitoring
Products: Tiger-i 2000

Tiger Optics Overview
Tiger Optics introduced the world’s first commercial “Continuous Wave Cavity Ring-Down Spectroscopy” (CW-CRDS) analyzer in 2001. Today, our instruments monitor thousands of critical points for industrial and scientific applications. They also serve the world’s national metrology institutes, where they function as transfer standards for the calibration of calibration and zero gases, as well as research tools for such critical issues as global warming and urban air quality.

In arable farming, ammonia emissions result from the application of nitrogen-containing fertilizers to the soil. It is critical that scientists responsible for optimizing animal feeds, animal enclosures, fertilizer design, and fertilizer application methods, as examples, are able to make accurate, real-time measurements of ammonia emissions to develop strategies to reduce its effects.

By contrast, the current technique for measurement of ammonia provides an average measurement over a specified time period. This method relies upon a two-step process, starting with passive sampling, followed by traditional wet chemical analysis. Thus, ammonia is captured on a sorbent material that is exposed to ambient air for a set time period – up to weeks depending on the application. Thereafter, the amount of absorbed ammonia is determined by a wet chemical analysis.

In contrast, CW-CRDS offers a continuous, time-resolved measurement that allows users to accurately measure the atmospheric concentration of ammonia at a rate of 1 Hz. Combined with relevant meteorological data, this allows the accurate calculation of ammonia flux.

The unit is compact – ½ rack-width, 5U high- and relatively lightweight at just 33 lbs (15 kg) – making it transportable and suitable for integration into a mobile facility. This is further enhanced by its low power consumption of just 40 Watts maximum.

The touch-screen interface, including integrated trending features, plus on-board data logging – five days @ 15 second logging interval, three weeks @ 1 minute logging interval – provides additional benefits for operation at remote locations. Data is retrievable via an RS232 or Ethernet interface. Real-time data collection to an external data logger or PC is available via the same two options, or the 4-20 mA signal output.

Tiger Optics CW-CRDS analyzers bring significant benefits to emissions monitoring, including:

- Accuracy traceable to the world’s major national reference labs
- Sub-ppb detection capability
- No zero or span required
- No periodic sensor replacement/maintenance
- Nano-second speed of response
- Wide dynamic range

The maintenance-free and calibration-free nature of CW-CRDS also affords low cost of ownership and allows users to operate with confidence and ease in the field. And, despite the sophistication and performance associated with this technology; it remains extremely easy to use.

Application Note ENV#3, Version 1.0, Publication date 16th July 2013

Tiger Optics LLC, 250 Titus Ave, Warrington, PA 18976-2426, U.S.A • Tel: +1-215-343-6600 • Fax: +1-215-343-4194 • sales@tigeroptics.com