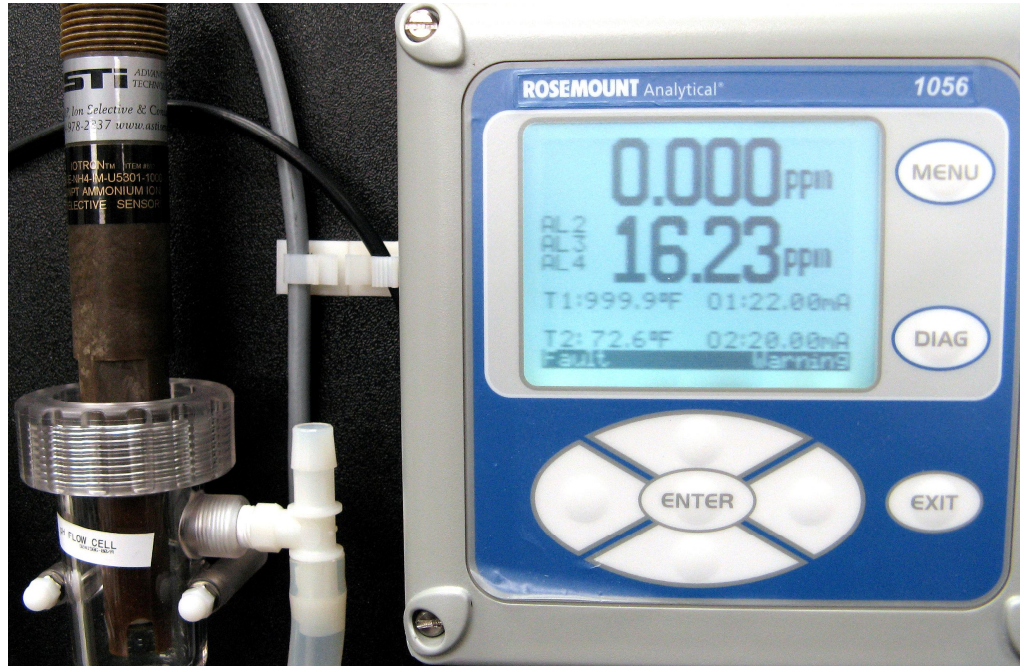


Features

- Guaranteed Longest Lasting Sensors Available with performance guarantee \*
- Sensors are compatible with most existing pH/ORP Meters, Transmitters & Analyzers \*\*
- Application Specific Engineering results in optimum Lifetime & Performance \*\*\*
- Integrated Temperature Compensation, Preamplifiers & Solution Ground Elements
- Solid State Reference System offers superior resistance to Fouling & Dehydration
- Applications such as Acid/Fluoride, Hi-Temp, Saturated Sodium and Sulfide Resistant are available as standard options
- Custom Applications are available, often at no additional charge
- Most Installation Styles are Supported Including: Immersion, Twist Lock, Valve Retractable & Sanitary
- Available in a wide range of plastics, from cost effective CPVC to thermally & chemically resilient ULTEM® and PEEK thermoplastic
- High Pressure Applications up to 100 psi for Valve Retractable & 150 psi for Inline Installations can be supported for continuous use
- Operating Temperatures from -30 to +150 °C (-22 to +302 °F) can be supported for continuous use

Case Study No. 18



**Measurement of Ammonia in Municipal Drinking Water for sterilization with Monochloramines**

Real-time continuous online measurement system for ammonia

- Low Initial Procurement Cost compared to competing technologies and offerings
- No need for chemical feed and rebuilding of sensors
- Lower Cost of Ownership due to very long sensor lifetime, low maintenance & cleaning requirements for inline, immersion & submersion ion selective sensors
- Intuitive and easy to use Rosemount 1056 and 1057 analyzer programmed and configured for ammonia and nitrate ion selective analysis
- All new systems come preconfigured, precalibrated and fully qualified to install, plug-in and immediately place into service especially for compliance purposes
- Only periodic 1-point grab sample offsetting is required – this “Standardize” calibration can be performed WITHOUT removing sensor from service!

The Problem

A number of municipal drinking water plants wish to carefully control their level of free ammonia (often also described as total nitrogen of NH<sub>3</sub>-N) and chloramine (also called monochloramine or MCL) used to ensure that the water remains suitable for human consumption. Until now, the technologies to measure the two species of interest for this application (free ammonia and chloramine) have been only possible with expensive sampling analyzers that required reagents, and significant operator involvement to ensure nominal operation. The result has been the operator and time intensive method of periodic grab sampling to ensure the sterilization system is working within the appropriate limits (typically 0.1 to 0.6 ppm for free ammonia for example) continues to be used at most facilities. The high cost of such sampling analyzers and the process of

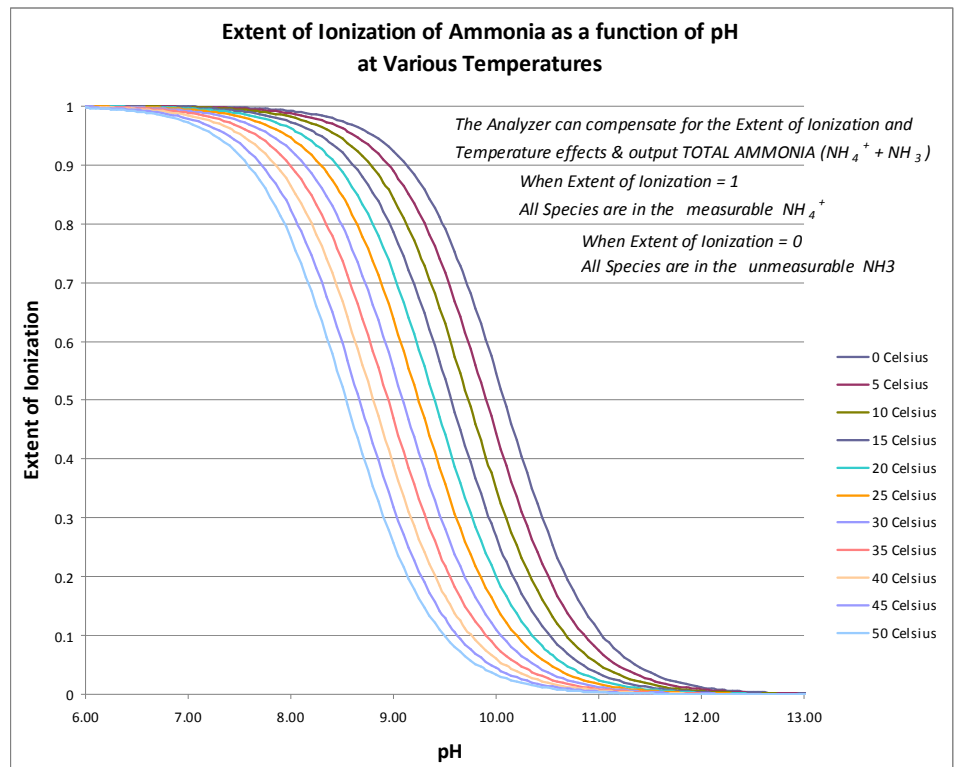
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grab sampling can often mean that not as much information about the process is available as would be desired for control and monitoring purposes. The labor demands or grab sampling can be particularly problematic with smaller and remote facilities that have less frequent operator presence due to personnel limitations. In some conditions, the pH and temperature can fluctuate throughout the year, meaning that the percent of ammonia (NH<sub>3</sub>-N) that will be in the measurable ionized ammonium form can vary.

### The Solution

In cases where monochloramine and pH are already measured, a single or dual channel ammonium analyzer is employed to monitor the free (residual) ammonia levels. In cases where no monochloramine measurement is performed, the monochloramine and free ammonia measurement can be combined into one dual channel analyzer to perform both measurements. For some installations a triple channel configuration of ammonia, ammonia and pH is the most cost effective option although other combinations are possible as well. The ability to measure in particular ammonia online in real time with minimal calibration and cleaning requirements makes it possible to record and control the process between grab samples, while the low up-front commissioning costs and low residual cost of ownership in terms of sensors and maintenance makes it possible to measure at more points of interest without exceeding budgetary restrictions. Since the conversion of dissolved ammonia gas to the ammonium ionized form in solution is a pH and temperature dependent process, ASTI offers the ability for this pH and temperature compensation to be performed in real-time as well to yield information about the total amount of free ammonia that is present (see graph below for details about this phenomenon). The graph shows that ammonium is the dominant form of free ammonia under most pH and temperature conditions common for municipal drink water facilities.



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The Solution (Continued)

The online ammonium ion selective measurement system can be calibrated for 1-point offset without removing it from service, making it ideal for low maintenance continuous use. The online ion selective measurement systems for ammonia can readily be referenced to most any grab sampling laboratory or portable method (including the popular colorimetric kits and existing sampling analyzers). Two-point calibrations need only be performed for new sensors in most cases once again minimizing the service needs. These online ISE systems are available for a wide variety of installation styles and can be integrated into any modern PLC and DCS systems.

Sensors are available in a wide variety of options including preamplifiers to support long cable lengths up to 300 feet and fully submersible assemblies to interface with any existing process connections and configurations. In addition, popular twist lock quick disconnect inline styles are also supported for easy of removal for periodic cleaning should it be required as are “plumb-and-play” low-flow panel that minimize installation time and labor.

Sensors Used for Measurement

*Sensors for in Tank Installations with Standpipe for Immersion or Submersion (with waterproofing option) – 3/4”- 1” MNPT Immersion Sensor Body Configurations*

**Model:** AB 6410-1000-10-TL Ammonium Ion Selective Sensor

**Description:** Ammonium Ion Selective Sensor with 1000 Ohm Platinum Temperature Compensation Element; 10 feet cable to connect directly to 1056 or 1056 ISE Analyzers

**Model:** PNZ 6052-1000-10-TL pH Sensor

**Description:** Industrial pH Sensor with 1000 Ohm Platinum Temperature Compensation Element; 10 feet cable to connect directly to 1056 or 1056 ISE Analyzers

*Sensors for Inline Installations with Quick Disconnect Bayonet Style Fittings - 1” MNPT Twist Lock Quick Disconnect Sensor Body Configurations*

**Model:** AB 8410-1000-10-TL Ammonium Ion Selective Sensor

**Description:** Ammonium Ion Selective Sensor with 1000 Ohm Platinum Temperature Compensation Element; 10 feet cable to connect directly to 1056 or 1056 ISE Analyzers

**Model:** PNZ 8052-1000-10-TL pH Sensor

**Description:** Industrial pH Sensor with 1000 Ohm Platinum Temperature Compensation Element; 10 feet cable to connect directly to 1056 or 1056 ISE Analyzers

Analyzers Used for Measurement

**Model:** 1056-XX-22ISE-32-YY (Ammonium / pH)

**Description:** Dual Channel Ammonium & pH Analyzer, Transmitter and Controller

**Model:** 1057-XX-22ISED-32ISE-42 (Ammonium / Ammonium / pH)

**Description:** Triple Channel Ammonium, pH and Nitrate Analyzer, Transmitter and Controller

*XX is the power supply option and YY is the output option (for 1057 only 4 each 4-20 mA output is available). ISE configuration must be specified at time of order. Complete ISE systems only available directly from ASTI as complete online measurement systems. Ion selective sensors are NOT available for sale without ISE analyzer as provided by ASTI. Application must be validated by ASTI factory prior to sale. References are available upon request.*

