



MSA Gas Detection System

[for Monitoring Carbon Dioxide and Carbon Monoxide in Highway Tunnels]

Application

A northeastern metropolitan port authority, needed to monitor carbon monoxide and carbon dioxide in an HOV tunnel and a bus tunnel.

There are two general approaches to this type of monitoring: locating ambient air sensors, which require local calibration, in the tunnel; or using a sample draw system that locates a common set of sensors at one end of the tunnel with a large pump that pulls the sample past these sensors. Factors involved in developing the best system for this application include the length of the tunnel, the desired speed of response, and the need for simple calibration procedures.

In this application, one of the tunnels contained an HOV lane for buses and cars while the other one is for buses only. This project required both a fast response (best provided by locating ambient air sensors within the tunnel) and a way to automatically calibrate these sensors monthly without having to close down the tunnels. A key concern of the end user was the cost and personnel protection that would be required to perform local calibrations within the tunnel. The customer was looking for a computer-based system that would be visible at the control room with the future capability of being visible at their main maintenance facility some 20 miles away. The software and equipment had to be easy to operate, and be OPEN protocol for easy future upgrading.



Product Description

The monitoring solution uses MSA Ultima® X Sensors that share common electronics and the ability to communicate with digital communication systems via 4/20mA outputs. Four sites in the tunnel are each monitored by two Ultima XE Gas Monitors for the presence of carbon monoxide and carbon dioxide gas. A built-in heater for the carbon dioxide sensors helps eliminate the effects of high moisture in the tunnel. Tunnel conditions require that sensors be mounted in a common stainless steel enclosure at an elevation above the height of a normal port authority bus.

In order to send and receive communications with the eight Ultima XE sensors located within the tunnel, the system uses Echelon LonWorks and Intellution Software. Both are open protocols used in thousands of installations around the world, providing the customer with a system that can be easily upgraded now and into the future. As a member of the LonWorks family of products, other LonWorks-compatible devices will operate along with MSA's family of Ultima Plus Digital Network Devices on the Ultima Plus Digital Network Communications Cable.

An Ultima Plus Digital Network System is used to monitor the two tunnels. Each tunnel's system operates independently, collecting real-time gas readings from each of the 4 locations and reporting back to an Ultima Plus Data Center Computer via a Lonworks twisted-pair data line. The computer displays gas monitor readings, control functions, component status and more, analyzes the readings, and generates fault and alarm indications. It is also responsible for generating a full sensor calibration every 30 days. This calibration takes approximately 45 minutes and can be manually forced from the maintenance screen. Alarms and monthly calibrations are recorded, stored and printed out on a local printer.

For more information on the standard Ultima X Gas Monitor and Ultima Plus Digital Network System see data sheets #07-2051 and #07-0007.



Note: This is a representative description of this product and its potential applications. Contact MSA Custom Products at customproducts@MSAnet.com for information on customizing this unit to fit a specific need.

Note: This Data Sheet contains only a general description of the product shown. While uses and performance capabilities are described, under no circumstances should the product be used except by qualified, trained personnel, and not until the instructions, labels or other literature accompanying the product have been carefully read and understood and the precautions therein set forth followed. Only they contain the complete and detailed information concerning this product.

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