

Ethernet-based Gas Detection System Provides Cost-Effective System Interoperability and Maximum Reliability

Situation

A well known sewer district with an aging infrastructure needed to install an advanced gas detection system during recent plant upgrades. The original design intended to have a central location for all the gas detection controllers, and connect all of the field instruments to this common location. Analog outputs and discrete alarm contacts were required at this location. This was a standard approach that had worked for years, but did have a high amount of installation cost associated with it. Installing what can be miles of wire and explosion proof rigid conduit can be very expensive in today's economy.



Solution

Sierra Monitor Corporation was the chosen supplier to meet this requirement. Cost effectiveness and competitive pricing was just the beginning. Sierra Monitor provided not only a state of the art gas detection system but also offered the most system interoperability choices of any supplier.



The Sierra Monitor solution involved the use of the Sentry Gas Risk Management System. Sentry allowed engineers to design the gas detection system Controllers so that each Controller was strategically installed throughout each plant location. Thus minimizing the amount of wire and conduit required, and significantly reduce the total installation costs of the project.

The satellite mounted Sentry Controllers provided local alarm relays for the field alert systems such as horns & strobes. This was to avoid using long lengths of "home run" alarm signal wires to a central location. The Sentry also provides an intelligent communication network for the Gas Sensor Modules. This enables the sensors to be multiplexed together on a common cable. Also, reducing the required amount of wire and lessening the project installation costs. These features combined with the universal Modbus RTU digital output made the Sentry an ideal solution. The only thing left was to adapt this system to the plant's existing Ethernet infrastructure which utilized Allen Bradley EtherNet/IP protocol.



The Sentry Modbus communications was converted into an Allen Bradley EtherNet/IP using a gateway from FieldServer Technologies, a division of Sierra Monitor. The FieldServer became the universal gateway to provide the most convenient way to connect these new gas detection systems into the plant-wide Ethernet. Using Ethernet to communicate to all of the satellite mounted gas detection controllers meant that critical alarm and measurement data can be obtained quickly and simply. This information can be used to display

critical data on operator workstations and archived for historian purposes. Ethernet is becoming widely accepted as the best communications choice for Supervisory, Control, and Data Acquisition (SCADA) systems. It is relatively inexpensive and easy to install. It can be shared between various systems to optimize the available bandwidth, and the hardware required to operate it is off-the-shelf.

This Ethernet interoperability solution would not be possible without the availability of intelligent controllers and intelligent gas sensor modules. The analog outputs of old transmitters only provide the operator with limited measurement data only. There are very few ways to truly validate how good an analog signal is. Using the new IT Series gas sensor modules from Sierra Monitor creates a smart device that not only provides measurement data, but also will validate how good that measurement really is. Alarm, events, gas levels, and specific trouble or fault conditions can only be transmitted using an intelligent gas sensor module with digital communications.

Sierra Monitor's new Information Technology, IT series, of gas sensor modules provides the most universal output choices available in the market today. Using the IT series modules with the Sentry Gas Risk Management system provides a very powerful gas monitoring system that can be connected to just about any external automation, monitoring and control system. Allen Bradley EtherNet/IP and Modbus TCP are just a few available protocols to meet this interoperability need. An imbedded Web Server is also available to meet the needs of those who just want to be able to monitor the system from a remote location and not require a full function SCADA system.

