

# Enabling ventilation monitoring to provide real-time data means and safer conditions

BY SHANNON KATARY



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As mines continue to expand underground and embrace new digital technologies, the primary goal is to ensure the safety of the underground miners. As a result, costs associated with greater distances to the working areas are increasing material handling and mining labour costs. Maestro Digital Mine manufacturers Industrial Internet of Things (IIoT) measurement and control instrumentation for the optimization of underground mine ventilation and underground digital networks. Maestro designs and manufactures products exclusively for the underground mine automation, IT, and ventilation sector that delivers energy savings and productivity improvements while meeting the highest health and safety standards.

The energy intensity of the mine greatly increases as the mine expands further away from the shaft. In many mines today, 50 to 70 per cent of the energy profile is directly related to ventilation. Proper ventilation is re-

quired to provide a suitable environment for miners and equipment to operate. There are limits to the gas concentration levels, as well as the amount of airflow required in mines to keep the miners safe today and tomorrow. Wet bulb temperature and heat stress are also important factors around ventilation. Worker productivity increases when the environment is within the comfort range of a human being.

To optimize any of these conditions, real-time data needs to be collected. Once it is monitored, the mine can start to control the required outcome. Maestro designed and developed a digital gas sensor to address the challenges of underground mining. They can be "hot swapped" by a ventilation technician without the requirement of any sort of underground calibration. Built upon the IoT (Internet of Things), the digital sensors have a complete suite of diagnostics to help determine the health of the complete

system and provide maximum system uptime.

The Vigilante AQS™ and the Zephyr AQS™ are both used to monitor the environmental conditions underground. The Vigilante AQS™ Air Quality Station provides the ultimate system with up to eight different real-time sensors, advanced diagnostics, and control functions. The Zephyr AQS™ Air Quality Station is a lower cost system that uses the same reliable sensors and advanced diagnostics but with only three different real-time sensors on board. It was determined that the Zephyr AQS™ will handle approximately 75 per cent of our current applications at a lower cost. Both systems plug directly into a network switch thereby eliminating the requirement of expensive and complex PLCs (programmable logic controllers). By doing so, this eliminates upwards of 50 to 80 per cent of the CAPEX requirements. Maestro continues to develop products that are fully open and agnostic using industry-standard communication protocols like Modbus TCP/IP and EtherNet/IP.

Monitoring the conditions in real time has allowed Maestro to deploy ventilation monitoring solutions in over 125 mines globally. Maestro has developed ventilation solutions that reduce downtime and enable miners to return to the face faster and safer. For more information, visit [www.maestrodigitalmine.com](http://www.maestrodigitalmine.com). ▲

“COMPACT, LOW COST ENVIRONMENTAL AIR QUALITY MONITORING SOLUTION FOR UNDERGROUND MINES.”



# Change your mine-set.

Lost Time = Lost Productivity.

## Zephyr AQS™ Air Quality Station

The Zephyr AQS™ is an IIoT device that accurately monitors real time environmental conditions reported back to surface via a digital Ethernet or an analog output connection to your network. Now there's a cost-effective solution for reducing downtime and getting back to the face sooner and safer.



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