

**Introducing the all new state of the art
Smart Head[®] Gas Monitoring System
from Conspec Controls**

Smarter than your average monitor
because it's digital



CONSPEC[®]

It monitors, records, remembers, warns the new state of the art Smart

Smarter than your average monitor yet because it's digital there is:

- less complexity
- at a lower cost
- with greater reliability, and
- the ability to provide accurate fault finding through greater knowledge communication via the Modbus protocol,
- to allow Condition Monitoring Preventative Maintenance

Smarter than analog monitors

Smart Heads are the absolute state of the art. Superior to the opposition monitors which use an analog signal, i.e. 4-20mA, to transmit the gas value to their controller. The Smart Head digitizes the gas signal directly at the sensor, the gas value is read from the sensor cell, linearized, temperature compensate and scaled into the units that the particular Smart Head is calibrated for, i.e. ppm or %V/V. CO or CH₄, etc. The Sensor transmits that value to the Controller, along with the temperature, operating voltage, etc., if requested.

It has functions for calibration, alarm configuration, outputs to drive strobes, or sirens and data memory.

Smarter design reduces material cost

The Smart Head Monitoring System is designed to reduce cost, equipment redundancy and configuration time, when several gases are being monitored at the same location by using a "smart" sensor, and separating the Sensor from the Controller.

The device consists of a micro processor, a gas sensor, temperature sensor and memory to store configuration parameters and current readings for access and communication by the Main Host using the Modbus protocol.

Smarter because it communicates using the most widely used protocol Modbus

Each Smart Head Controller can interface with up to eight Smart Head Sensors, each reading a different gas. The Smart Heads are powered from and communicate over a single four conductor backbone cable that is connected to the Controller. All serial communication uses the Modbus RTU open protocol, a widely used, rugged secure industrial protocol.

Smarter because it enables planned maintenance rather than response to critical failure

Important operating parameters stored in each Smart Head, such as a guaranteed unique serial number for unit life time tracking, all of which are available from the controlling host computer, to enable management to plan maintenance rather than respond to a perhaps critical sensor failure as with monitors that use analog signal.

Characteristics	Smart Head Sensor DIGITAL	Competitor's Sensor ANALOG
Signal digitized at source, Gas value, temperature, etc., no analog signals	YES	NO
Transmitted signal Noise immunity	Very High	Medium to low
Transmitted Signal Error Detection, CRC	YES	NO
Low power consumption	YES	Varies with gas level
Characterized over operating gas and temperature range	YES	NO
Use Open Modbus protocol	YES	NO
Stores Operating data for real time analysis	YES	NO
Unique embedded Serial Number for lifetime records	YES	NO
Stores previous calibration values, for real time sensor cell analysis	YES	NO
Smart device, stores all its operating parameters available in real time	YES	NO
IP66 rated, o ring sealed, in custom designed tough antistatic Nylon & SS case	YES	NO
SS plenum chamber sensor	YES	NO
Operating and Historic Data available in real time in the control room	YES	NO

Smarter initial range of 4 growing to 9 monitors to cover all eventualities

For stage one certification there are the four main coalmine gas sensors: Oxygen, Carbon Monoxide, Carbon Dioxide and Methane. Stage two will include an analog input Smart Head, Airflow monitor Smart Head and a Smoke detector Smart Head. Stage two will also include the certification of a high speed local controller; all of these will be certified as I.S. Equipment.

Smarter from the experience of supplying the Canadian, American, Australian, Mexican and Chinese markets.

s and advises if it needs replacement... t Head Gas Monitoring System

How the Smart Head Gas Monitoring System can help mines in the Journey to Operational Excellence

Sandy Dunn of Assetivity (see Condition Monitoring) has argued that the size of the benefits on offer to an organization by utilizing Condition Monitoring techniques... varies, depending on where... that particular organization is on the Journey to Operational Excellence as illustrated below:

1st and 2nd Stage — “Don’t Fix it”... “Reactive”

In these days of responsible management, organizations have moved beyond “Don’t Fix it” and “Reactive” fix it after a fault has developed. This is no longer acceptable because of the costs of down time due to loss of production and safety can be compromised.

The problem can be the technology to move beyond this old paradigm. Hence the need for digital.

3rd Stage “Planned”

This is the realm of the Conspec Smart Head; its whole design is based on the premise that planned preventative maintenance is the required maintenance scheme for gas monitoring of equipment.

Each Smart Head stores operational parameters: a copy of past calibration results, operating temperatures, real time records to enable suitable analysis of operating voltage, etc. This enables the supervising system to log the operating parameters of the Smart Heads and for instance plot the internal periodic calibration records as a means of predicting the operating life of the sensing cell, allowing orderly replacement instead of an emergency response.

4th Stage “Proactive” — Improving the Smart Head

Because the Smart Head has all its operational information stored internally, Conspec Controls, or the equipment owner, can periodically download that data, either in real time across the web or periodically at service or calibration check time. That data can then be stored; Conspec keeps lifetime performance and calibration records for all its gas monitors, and for the Smart Heads will be available to our customers via secure Internet.

Conspec will analyze this data to improve the performance of the Smart Heads over time as we have used the data from our previous range of gas monitors as a baseline for measuring and designing the Smart Heads.

Condition Monitoring in the 21st Century

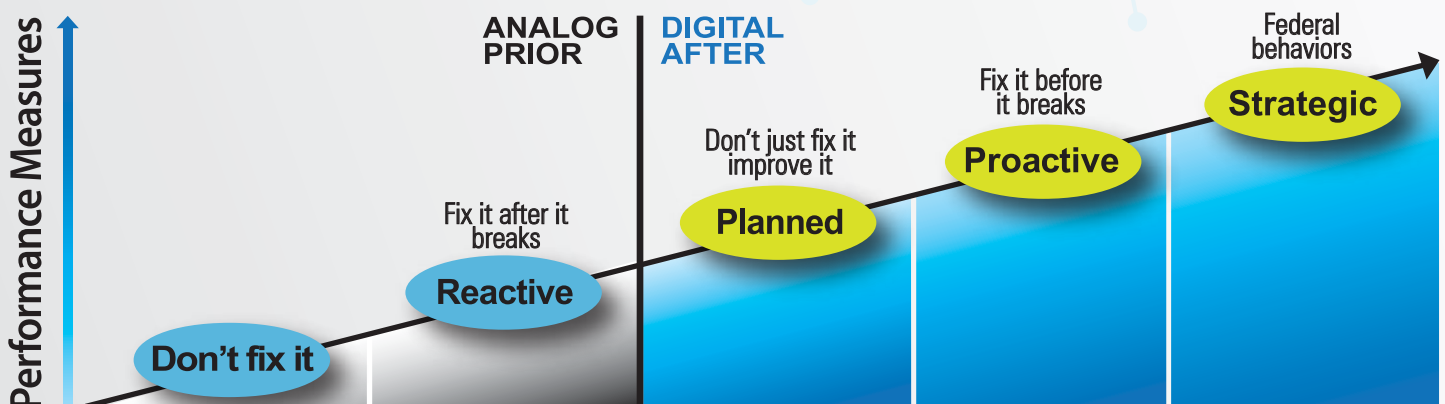
Condition Monitoring is the use of advanced technologies in order to determine equipment condition, and potentially predict failure. It is the foundation for the use of Predictive or Condition-Based Maintenance techniques.

“In my view, the business need that is likely to dominate the industrial maintenance scene, at least for the first part of this century, is Asset Effectiveness — the need to extract maximum profits from the minimum investment in plant and equipment. How do we achieve this through the use of Condition Monitoring technologies? In one of five ways:

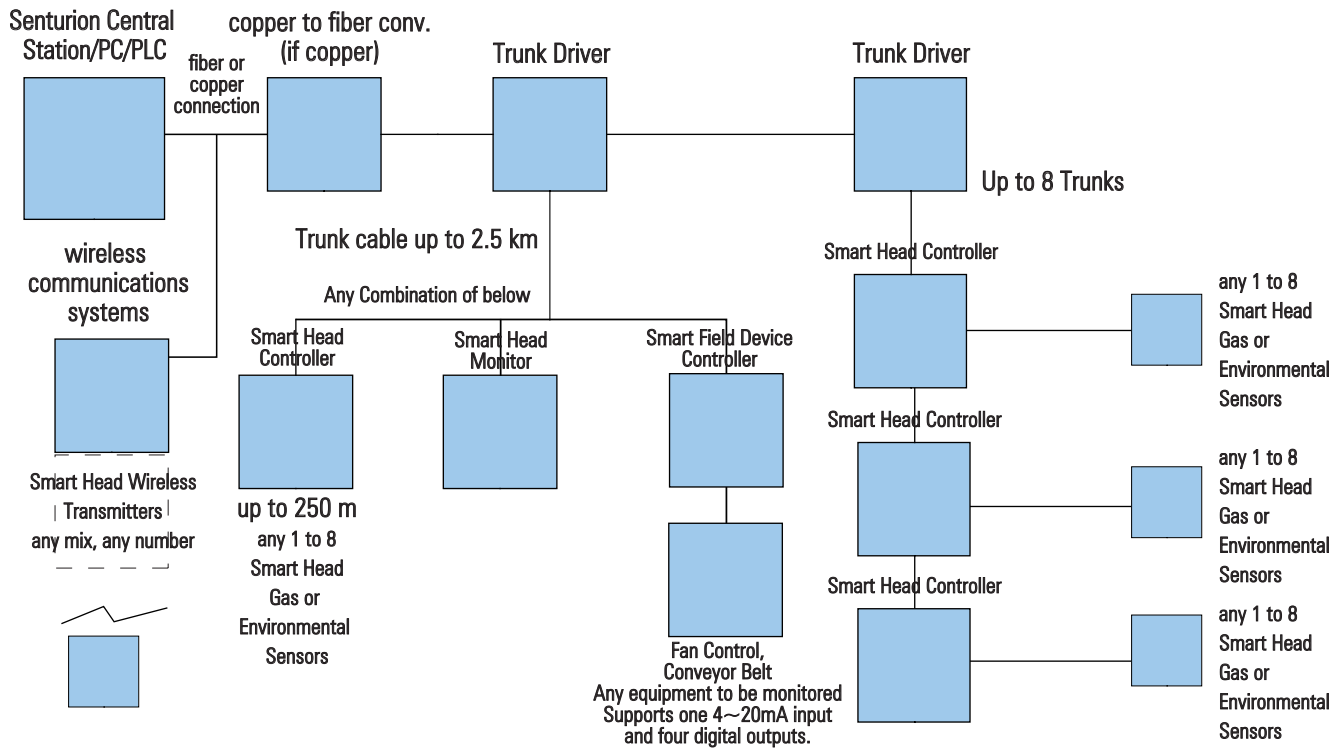
- By improving Equipment Reliability through the effective prediction (and then avoidance) of equipment failures.
- By minimizing downtime through the integrated planning and scheduling of repairs indicated by Condition Monitoring techniques with those indicated by other techniques.
- By maximizing component life by avoiding the conditions that reduce equipment life (for example, by ensuring ongoing precision alignment, minimal lubricant contamination, etc.)
- By utilizing Condition Monitoring techniques to maximize equipment performance and throughput.
- By minimizing Condition Monitoring costs.

(Courtesy of Sandy Dunn of Assetivity Pty Ltd, from his excellent article “Condition Monitoring in the 21st Century” who asserts full copyright.)

THE JOURNEY TO OPERATIONAL EXCELLENCE



New Conspec Smart Head System



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mining safer...
for everyone.**



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