How to Reduce the Cost of Gas Detection with the Right Solution

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Competition in the global market place has helped to drive down the cost of gas detection, and means that today's customers have access to a myriad of differing solutions. The down side of more choice is the fact that there are more options, specifications and features to consider so it's even more important to spend time evaluating possible solutions within the context of the applications you plan to use them.

Functionality and the difference between "smart technology" and a "smart solution"

When it comes to gas detection, there are two kinds of "smart"; a device that uses in-built intelligence such as a detector using firmware to help deliver enhanced diagnostic data and a device that delivers a "smart way of operating" even though it may be less "cutting-edge" in terms of the technology it employs to get the job done.

A good example of how these aspects differ can be illustrated by the following portable gas detection examples. The Impact range of multi-gas detectors from Honeywell Analytics uses automatically recognised plug and play, pre-calibrated sensor cartridges (for the detection of up to four gases). These smart cartridges include all alarm settings and calibration data enabling them to be swapped out easily and quickly, making for simplified ongoing maintenance. This cartridge design is a good example of how in-built technology and software can be utilised to deliver a smart end result.

Figure 1: GasAlertMicroClip XT

BW Technologies by Honeywell's portable gas detectors, including GasAlertMicroClip XT, feature "IntelliFlash" technology, an LED driven visual indication that highlights device compliance to site standards (when a device is not being bump tested in line with pre-defined site standards, the LED will not flash green).

Although the use of an LED is not in itself revolutionary, the end result delivered by IntelliFlash is; it provides an easily accessible cue to safety managers and users alike, that makes non-compliant devices easier to spot and helps to promote adherence to site standards, enhancing on site safety. These polar examples show the difference between smart technology and a smart result, highlighting the fact that it is not just state-of-the-art technology that has the power to deliver true value and reduce ongoing costs.

Reduce the time; reduce the cost

Any aspect that helps you save time – whether it relates to ease of use and training or simplified ongoing maintenance – has the potential to save you money. Reducing your labour spend (even by just a few minutes), is one way to dramatically reduce ongoing costs over time, as the following examples highlight.

Honeywell Analytics' Sensepoint XCD (which includes a standard model, a remote toxic version and a remote flammable version), features a tri-colour display that clearly indicates the unit's status at a glance – even from a distance; steady green for normal operation, flashing yellow to indicate a warning/fault status and flashing red to indicate an alarm status. Sensepoint XCD is in fact the only model to provide a full colour-illuminated screen that is easily seen from a distance. An example of the cash saving potential of this attribute can be illustrated by the following example: Consider a plant set up, where a series of devices are monitoring for gas hazards and are feeding back information to a PLC.

If a hazard occurs, the maintenance engineer must enter the area, and find the unit that has gone into warning/fault. If the plant is large with many points of detection, this can take some time.

In the case of Sensepoint XCD, the device in warning/fault will be clearly visible by its bright flashing screen, meaning that the engineer can get straight to the unit. The simplicity of the colour coding means that the device's status is instantly identifiable with a simple glance. This can be the difference between an engineer needing to spend 1 hour to locate and access the device or as little time as 10-30 minutes.

A time saving does not need to be as large as the example above. The following hypothetical example shows the true value of what can be achieved by shaving off as little as just two minutes carrying out a repeatable activity. Consider a site that has 100 gas detectors; if each unit takes 10 mins to check and re-calibrate, the time required to complete this activity would be just over a day (1.04 days) based on a day consisting of two 8hr shifts / 960 mins.

Figure 2: Sensepoint XCD

Compare this with an identical plant that has 100 gas detectors that only require 8 mins per device to check and calibrate and this activity would take under a day (0.83 days), meaning that the total time taken could be reduced by 21% by saving just two minutes per device.

When it comes to reducing costs an intuitive, simple to use and familiar platform can help you save money on training. A device like the XNX Universal Transmitter, from Honeywell Analytics, can be configured to accept inputs from any of Honeywell Analytics' gas detectors - even when different types of detection principles are employed.

This means that users only need to be trained on one single transmitter device for all gas detectors on site. When you consider the cost associated with training fees (which can be in excess of 2000€ per day), coupled with additional travel and labour cover expenses, this can provide thousands of pounds worth of savings in a relatively short amount of time.

Minimising negative impacts to production

Figure 3: MicroDock II

Production loss can be very costly and a prime consideration when selecting gas detection is implementing stable solutions that minimise the chances of nuisance alarms, warnings or faults that could negatively affect daily yield.

Devices like Sensepoint XCD are also able to limit the chance of incorrect set up and calibration – which can lead to nuisance alarms – and this helps to maximise device uptime. Valuable aspects indeed, considering that just one nuisance alarm can cost thousands of Euros in lost revenue.

The same can be said of BW Technologies by Honeywell's range of portable gas detectors, which can be used with the MicroDock II test and docking station for automatic, one button bump test and auto device calibration, helping to negate operator error which could lead to incorrect device settings.

The value of plug and play and simplified sensor cartridge swapping

Ease of sensor cartridge swapping and calibration can also deliver savings. This can be highlighted by the auto recognition Plug & Play sensor cartridge capabilities of Apex from Honeywell Analytics, which use smart pre-calibrated sensor cartridges. These types of device can be taken out into the field and changed over in just one minute. This means that the change out of 100 Apex sensor cartridges would take just under two hours to complete. If the same site has 100 devices that use standard sensor technology (with each device requiring 20-30 minutes to change those sensor cartridges over and re-calibrate in the field), this activity would take approximately 3 ½ days - a sizeable 2,800% longer than with a device like Apex.

Enhanced digital communications: why it's good to talk

It's no wonder digital communications protocols like HART are becoming ever more popular; HART's digital signal can be superimposed on an existing analogue 4-20mA wiring topology. This means that the user can enjoy all the benefits of HART communication – which includes aspects like accessing live data, status and diagnostic information from

Figure 4: Apex

intelligent field devices - with potentially no additional infrastructural costs.

HART can help sites save on long term costs by facilitating proactive maintenance rather than reactive.

The ability to gain device information from anywhere in the loop also means that field engineers don't need to take a trip into the field; they can know the scope of work required before they go, allowing them to plan maintenance in advance, for added efficiency. The XNX Universal Transmitter from Honeywell Analytics includes a HART output as standard, providing users with enhanced device communications capabilities.

Maintenance: be proactive not reactive

Preventative maintenance is preferable to reactive because it allows the opportunity to schedule and plan routine work so it has a minimal production impact. A big factor in facilitating preventative maintenance is the implementation of solutions that can self diagnose, warn of potential issues and feedback various status indicators to control. A device that has no undetectable failure modes (also known as a fail-to-safety device), offers enhanced protection and ensures that if a fault occurs, it is always identified.

An Infrared (IR) Open Path device such as Searchline Excel operates with no unseen modes of failure. By the nature of its design and operation, it is self-diagnosing because an IR Open Path device is able to warn of other aspects such as "dirty optics" which can be indicated by a diminished signal. If the beam becomes blocked the device will also be able to alert to this fact (unlike a catalytic bead device, which needs to be regularly gas challenged to check it can detect gas).

It's essential to select the right detection principle for the application; although an IR device might seem more appealing than a catalytic bead device, owing to its fail-to-safety-operation, both principles are preferable in varying situations. For example, an IR Open Path device has a high initial cost, it provides the highest potential device availability, has a low ongoing maintenance requirement and is able to self diagnose.

This makes this type of device ideal for high-risk areas, offshore installations and locations where labour is very expensive (such as a production platform). A catalytic bead driven device has a low initial cost, it requires Oxygen to work and its sensors can be killed by known poisons such as Silicone.

This type of device does not offer fail-to-safety operation and requires regular maintenance (sometimes as often as every three months). This makes a catalytic bead detector an ideal solution for a less challenging environment or locations where labour costs are low. This type of detection is also suited to plants where there is easy access to the area where the devices might be located. These examples highlight the fact that a principle of detection's value can only be fully ascertained within the context of the application in which it will be used.

Portable fleet maintenance made easy

Portable device care is now potentially more intensive, following best practice guidance regarding daily bump testing. By automating necessary activities such as bump testing and data logging, businesses can dramatically reduce the time spent maintaining their portable fleets. This has led to the emergence of automatic test and docking stations like MicroDockII from BW Technologies by Honeywell.

MicroDock II is compatible with all BW Technologies by Honeywell's range of portable gas detectors. A device is simply clicked into the docking station, and the user has the option of carrying out three tasks; performing a bump test; carrying out a data transfer or performing a calibration.

Each of these activities can be carried out with a single button press and are completed in just a few moments.

Test gas levels are controlled and minimal training is required to use the device, reducing the time spent testing and ensuring the portable unit is ready to detect gas effectively.

Aside from creating a simple, minimal training solution, MicroDock II can also help to reduce operational costs in a number of ways; for example, a portable unit may be being tested as much as once a day.

A manual bump test could take 5 minutes to complete compared with just two minutes using MicroDock II, equating to a time saving of 12 hrs over a year.

At a site where 100 workers bump test their devices once per day, this 60% time saving expands up to 1,200-hours saved in total, per year. This example highlights the fact that small daily time efficiencies can equate to considerable savings over time.

MicroDock II's data logging capabilities also mean that data relating to portable testing can be stored and analysed; the device will keep records of the instruments that were tested, highlighting non-compliant users and allowing the fleet manager greater visibility of device status.

When combined with its accompanying Fleet Manager II software, MicroDock II adds additional dimensions of value. For example, a store manager can cut the time spent issuing a new portable device to an operator from about half an hour to just five minutes – with no paper trail or forms to be filled out.

The automatic generation of paperwork such as fleet status reports and calibration certificates can also be produced with devices like MicroDock II combined with Fleet Manager II software. Logged data can be easily converted into a variety of reports by using the intuitive software interface and a PC.

Adding value is increasingly important in today's marketplace as suppliers and service providers fight to gain market share and differentiate from the competition.

The combination of MicroDock II and Fleet Manager II, when used for ongoing care of a portable device like GasAlertMicroClip XT, is particularly beneficial to service providers, allowing them to add more value to their customers by giving them data on fleet use and status, facilitating better client advice and guidance.

Figure 5: Fleet Manager can help to simplify portable gas detector fleet management

A Case-by-Case approach

Local factors and individual plant set up will have a massive impact on whether one device is more suitable than another in terms of providing a cash saving.

In reality, there is a plethora of factors that can influence the selection of gas detection solutions capable of reducing the ongoing cost of gas detection.

It's important to work with a supplier who can provide multiple technologies and specification variance, as this will enable them to give impartial guidance on choosing the right solution that is truly fit for purpose, based on your individual needs.