

Dr . X - Plant and Machine Monitoring at its Simplest



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How to improve plant maintenance and machinery health monitoring by simplifying the measurement task thus reducing instrumentation investment costs, manpower and training.

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Measurement - the general case

What is the end result of most measurement tasks? What is really wanted? So what happens?

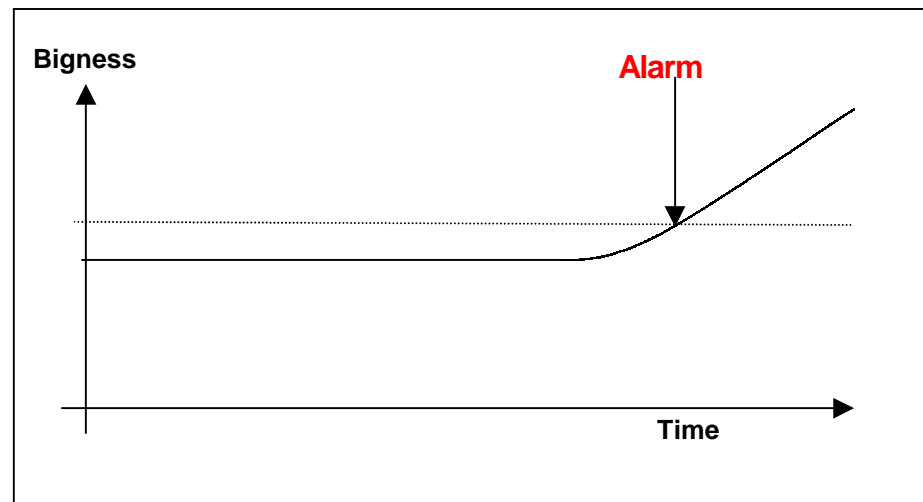
What is the end result of most measurement tasks?

Most measurement tasks tend towards a binary result; that is, GO or NO-GO; PASS or FAIL; STOP or START; osv.

Most operators want that binary result to cause them to undertake a binary action; usually DO SOMETHING or DO NOTHING.

For example: IF its too dark THEN switch the light on. IF its raining THEN open the umbrella. IF the container is full THEN stop the feeder. Speedometers in cars are analogue instruments which hardly anyone uses as such - for most people their application is confined to: IF I'm above the speed limit THEN slow down.

Regardless of whether the process is analogue or digital the actual requirement tends to this simple decision. This can be expressed graphically as:



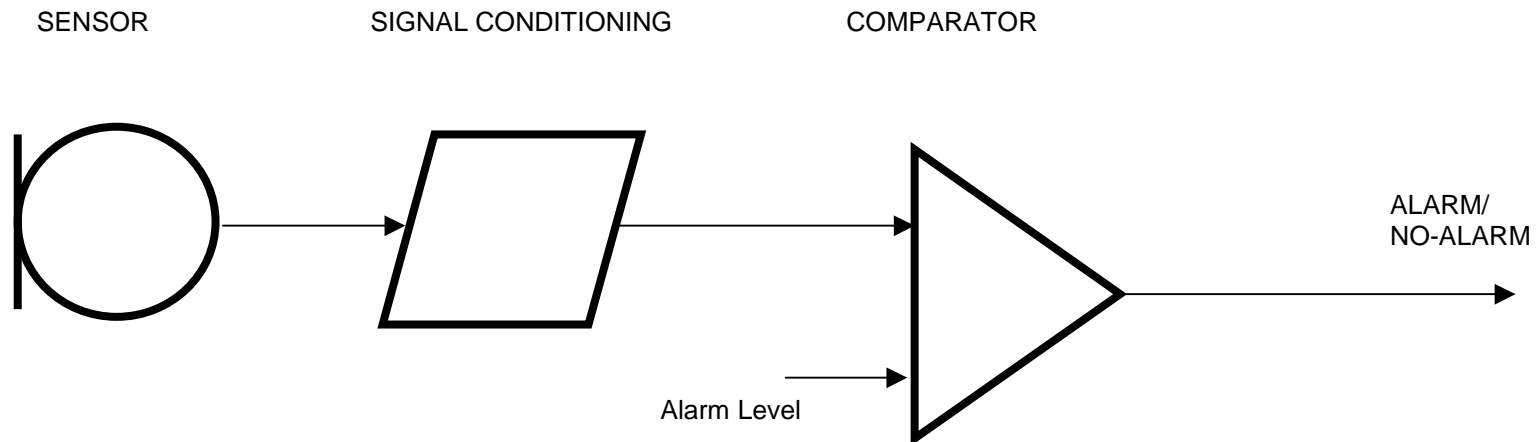
What is really wanted?

In 'real world' instrumentation the need is as follows:

- to accurately monitor a process or condition using some form of sensor.
- set a threshold level at which an alarm would be raised.
- if this threshold is reached, raise an alarm.

So what happens?

The traditional solution to this problem is over-complex and over-expensive, as well as giving far too much information to the user. Throughout the world the general solution is to take a sensor, apply some signal conditioning, quantify it (either analogue or digital) so that it becomes 'data' or a 'number', then using this data feed it into a comparator of some sort in order to make the go/no-go decision.



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DrX - Integrated solution for the bulk of monitoring decisions

Combining all the current elements into a single solution

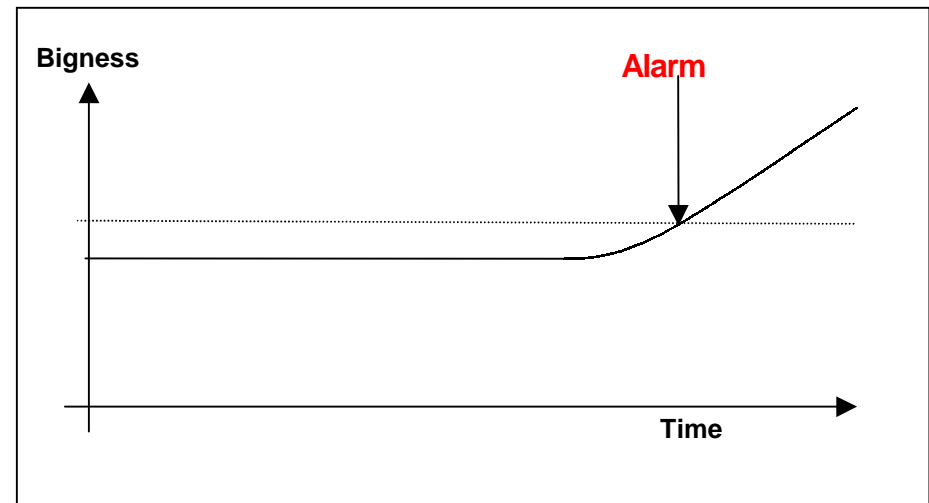
How do DrX modules overcome the obvious environmental variation problems?

Referring back to the fundamental operating graph there are two main issues when trying to achieve this simplest decision:

- 1) Where do you start from?
- 2) When do you trigger?

There is also an invisible question here for the usual 'numerical' approach:

- 3) How do you know what numbers to use?



The design approach for DrX has eliminated any need for quantitative analysis and has purposely eliminated the need to answer question '3'. Question '1' and '2' are answered simply by virtue of the products design, how it is set-up, and how it is applied.



DrX Modules

How they are implemented and what type of measurements they can address.

Set-Up - accommodating the status quo

DrX modules are installed on the unit under test. The only set-up operation required is to establish the level of environmental noise during normal operation. This is done by means of a small screwdriver which adjusts the trigger threshold of the unit. When the light on the body of the unit is green then the threshold is higher than the environmental noise level; if it goes red then the threshold level is lower than environmental noise.

No numbers - simple observation.

Set-Up - where is the threshold?

Once the environmental noise level has been determined then a further turn of the screwdriver will set a threshold level of about 2% higher than the environmental operating level.

Again this level of accuracy is all that is required in most industrial applications.

Innovative features

A wide range of sensor technologies integrated with set-point detection provides a simple and local indication of process change. This can be bearing wear, liquid or gas leaks, fluid flow, temperature change, vibration, mechanical knocking, electric arcing, and basically any process that emanates some measurable parameter, which is detectable with contact sensor technology.

The physical design ensures good, consistent and non-critical sensor presentation to the workpiece or process.

The key innovative features are:

- Simplicity of presentation – 1 light, green=good, red=bad
- Ease of commissioning – 1 adjustment and no measurements required
- Injection moulding a commercial connector into the unit's body
- Sensor presentation by using custom made plastic injection moulded springs
- Integration of signal conditioning and set-point detection circuitry
- Ultra low cost for its functionality, and consequently 'throwaway'
- Positioned from the outset for international marketing and agency/distributor selling

SUMMARY - An innovation delivering real business benefits

International market feedback is positive and the product is obviously 'right for the time'. DrX is targeted to offer a significant solution to sustaining healthy plant, despite the extensive reductions in maintenance and inspection staff currently occurring in industries worldwide, coinciding with the demands for closer and more efficient monitoring, and providing a low-cost, off-the-shelf solution to a large range of previously unmonitored points of operation.

They provide a solution to deskilling and de-manning in industry whilst operators are faced with increased environmental, efficiency and legislative demands in the worldwide arena. The process industries in particular, especially in countries with lower literacy standards, are tending to employ fewer skilled technicians and yet require improved plant performance.

From the outset the DrX product has been designed to have the simplest human interaction (it can however, interface to more complicated systems if it requires). From a more forward looking aspect they offer major savings and improved maintenance integrity. They also offer rapid solutions to increased health and safety issues, environmental legislation and energy management conscious operators.

The products are:

- easy to use
- low cost (c<180EURO)
- quick to deploy
- fit & forget
- standalone or integrated
- suit a worldwide market