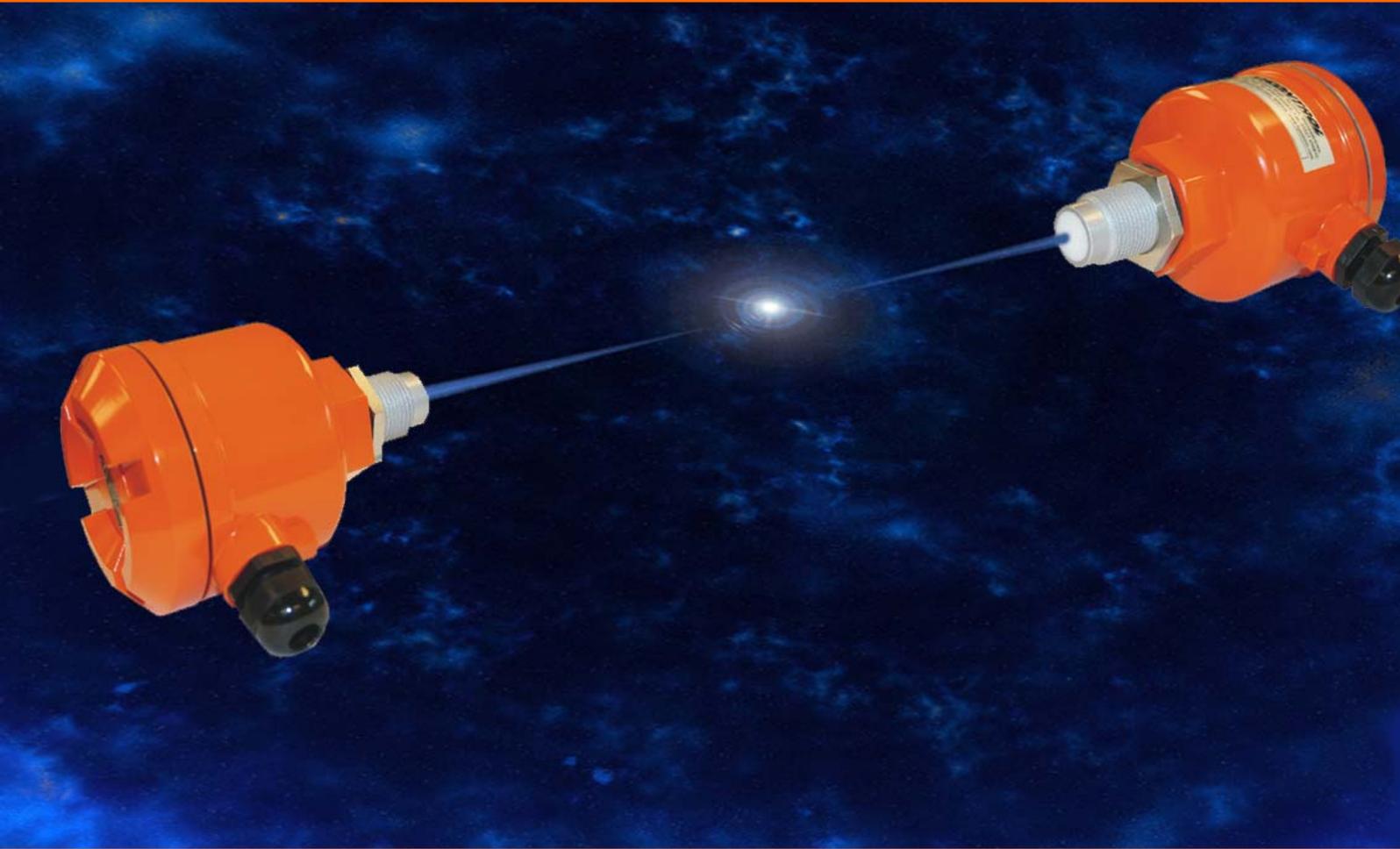


MicroSense



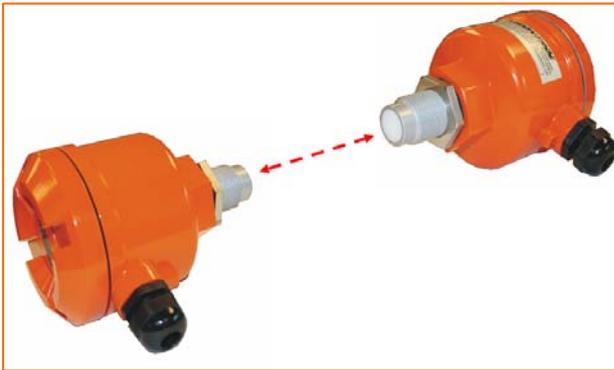
New long range 'thru beam' microwave switch for object and material detection has multiple applications in Xtreme operating conditions

Leading Process Technology
from

HYCONTROL

New long range 'thru beam' microwave switch for object and material detection has multiple applications in Xtreme operating conditions

Leading level measuring specialists Hycontrol are introducing their new versatile MicroSense microwave switch. 'Thru beam' technology has been used in industrial switching applications for a number of years, but in many installations product reliability and performance are questionable, especially in arduous industrial applications where extreme dust, vapours, side wall build up or high temperatures are present. Now this new generation of instrument, which overcomes traditional thru beam shortfalls, is already finding a wide range of applications in areas where more traditional methods have failed in industries ranging from food to quarry and mining.



Each switch subsystem is comprised of two components, a microwave transmitter, which generates a low power 24 GHz microwave beam, and a receiver unit with a maximum operating range of 40 metres between the two antennae. The two units are mounted facing each other and in the un-switched state the narrow beam from the transmitter is detected by the receiver. If the path of the beam is then interrupted by a sufficiently

reflective or absorbent material (within pre-programmed time and attenuation parameters) the internal relay is triggered, thereby activating the switch. A time delay function can be set from 0.1 to 10 seconds to avoid spurious or unwanted beam interruptions. The detection mode is selectable so that the relay is initiated either when the beam is broken or restored, similar to **normally open** or **normally closed** switching terminology. The MicroSense's switching capabilities are unaffected by dust, steam, smoke or heat, whilst build up of material on the antennae has little or no effect on the operation.

A critical part of the success of the innovative MicroSense is the fact that it uses the latest *heterodyne* microwave detection technology, which offers a number of operational advantages over competitive techniques. Firstly it allows the system to operate with a minimum received power that is lower than competitors' units. This increases the operating range and penetrability, without any need to increase the power of the transmitted microwave radiation.



Secondly, systems based on the older diode detection technology have to have multiple sensitivity set points for any given detection range and are therefore not easy to set up requiring a complex three stage procedure to ensure satisfactory operation. By comparison the MicroSense is calibrated in one easy step via the sensitivity dial. The 15 LED indicator array at the

back of the receiver unit displays the received power level from the transmitter and the set-point sensitivity, thereby allowing quick simple and effective calibration.

Applications

Microwaves will pass through a wide range of materials ranging from plastics to fire bricks, typically only being attenuated by metals and water. The switches can be supplied with a range of different mounting accessories and, where necessary, they can be used in conjunction with microwave-transparent inserts to protect the antennae. These are especially effective in applications involving elevated temperatures or corrosive material. Switches can be supplied for ambient applications up to 180°C, whilst for higher temperature applications up to 600°C, wave guides can be used so that the units themselves are mounted sufficiently distant from the heat source. This makes them suitable for applications in steel works, glass works and incineration plants.



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Blocked chute or pipe detection

Blocked chutes and pipes cause severe disruption to any manufacturing or processing industry. In quarrying, product is constantly on the move along belts or down chutes. Blockages can happen relatively quickly and are clearly detrimental in terms of lost production and also safety. For such applications the switches are set up to ignore falling material and acceptable build-up of material on the walls, but detect any blockages. (The photo above shows MicroSense systems fitted to two chutes at a quarry)

In another example the switches can be used to detect unwanted build up in pipes of viscous products such as paste or slurry build up.

Vehicle safety barriers

With a range of 40 metres, the MicroSense is ideal for monitoring vehicle movements, for instance in applications involving the reversing of large vehicles at building sites and quarries or vehicle positioning in filling bays. It is particularly useful in situations where drivers of large tipping vehicles forget to lower their



Photo courtesy of E E Green and Son Ltd

tipping body after discharging their load. The switch can also be used for height restriction warning for vehicles going under bridges, gantries or overhead cables. At ports and terminals applications are as diverse as counting rail trucks or ensuring overhead crane safety. Where applicable the receiver unit can be mounted on mobile equipment and the transmitter fixed at a selected location in order to provide a dynamic safety warning system.

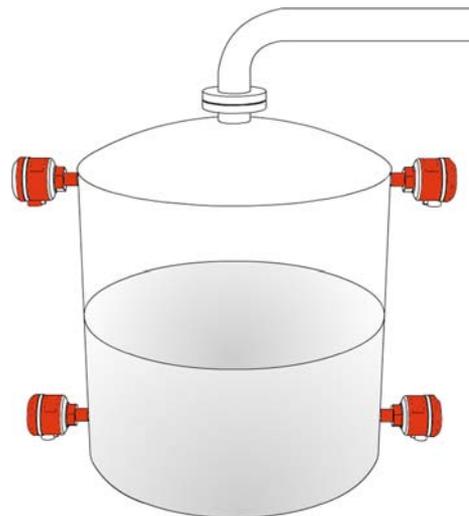


The photo left shows a conveyor at the Sims Group UK Ltd recycling plant at Long Marston near Stratford on Avon, which had been the subject of ongoing vehicle damage. Despite clear warning signs, including one directly on the conveyor, lorry drivers were still forgetting to lower their vehicles' after discharging their loads, with expensive and disruptive consequences. It was after the conveyor had been damaged for the second time in a few months that management decided they had to take decisive action. The MicroSense provided the ideal solution and now gives clear visual and audible warnings

if drivers attempt to drive near the conveyor with their tipper bodies raised.

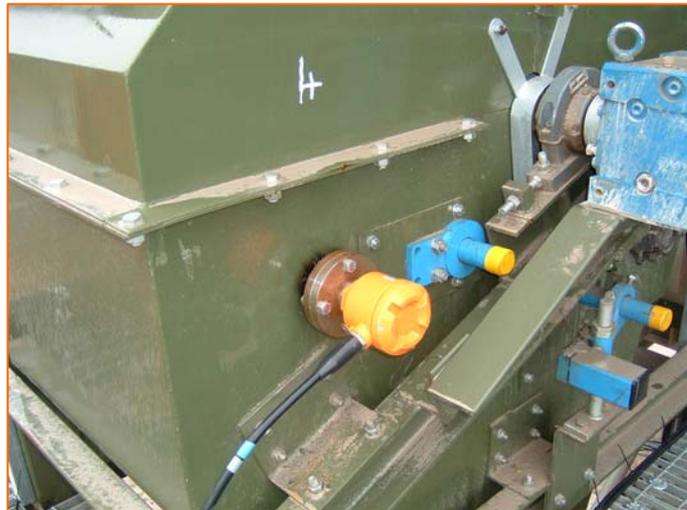
Level Control

The switch provides a cost effective and very reliable non-intrusive level control solution for liquids and solids, especially in simple high and low level alarm applications. Where multiple sets are used in close proximity, the units are orientated so that there is no cross beam interference. Applications on vessels such as separation cyclones cannot use intrusive switches and therefore this non-intrusive technology provides the perfect solution.



Material Product differentiation

Using the principle that microwaves will pass through low dielectric products, it is possible to use the MicroSense to 'see' through one product and not through another. Typical examples of this are to detect if a product is in a carton without seeing the carton itself or level detection in a glassfibre or plastic vessel without the need to cut new process connections into the vessel: the switches can simply be mounted on the outside!



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