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Radar sensors take another step forward

INDUSTRY FOCUS: Flow & level control

Radar sensors take another step forward

The VEGAPULS non-contact radar level sensor is generally considered 'state of the art' in the market place. Approaching 250,000 installed and operating, these instruments are the highest selling non-contact radar based level sensors in the world. Time to sit back and relax? Far from it, **VEGA** is now launching the latest generation radar level sensors, moving the technology forward with improved signal processing, accuracy, response times and power usage

Over the last 17 years of radar technology, VEGA has continually developed its range, to maintain its position in the sector. The first pulse radar devices were launched in 1992, the revolution came when they introduced the world's first two-wire loop powered radar in 1997, at the time many companies said there was 'not enough power' in such devices, but produced their own some years on. In the following years, further performance enhancements were added to improve signal reliability and work on reducing the cost of devices to be price competitive in applications, which had previously used ultrasonic sensors. In 2004, two-wire loop powered radar designed for solids level measurement was added to the range for silos up to 70 m.

For the last 6 years, VEGAPULS radar, and all other VEGA level technologies, have been integrated into the 'plics system'. This concept provides users with simple selection, easy ordering and intuitive setup. 'plics' is a united range of products that make it easy for engineers to understand, standardise and train on, saving them time and money. So to further improve and develop this platform, VEGA take this a further step forward with plicsplus – and VEGAPULS radar is the first product in this new format.

plicsplus

With its instrument concept plics, VEGA has been simplifying the world of measurement technology since 2003. The concept is based on customising through a modular housing system, electronics and process fittings teamed up with standardised adjustment for all measuring principles.

The focus of the plicsplus development is the continued simplification and standardisation of measurement technology for the user. With its additional double chamber housings of plastic and stainless steel, plicsplus

offers a unique selection of housings in three different materials, (also in epoxy coated aluminium). The instrument adjustment directly on the sensor is also made easier, thanks to the revised indicating and adjustment module, PLICSCOM.

Handling of the new sensor electronics, with IEC 61508 SIL2 'designed-in' is really easy. New spring-loaded, removable terminals make connection of the power supply and signal cable easier. New plug-in terminal blocks aid faster installation and an electronics exchange, if ever required, can be carried out in a few seconds.

Other features of all the plicsplus sensors are: lower voltage power supply of 9.6V, faster signal processing, higher measurement accuracy through more efficient microprocessors and in the near future, an optional, integral GSM/GPRS SIM card module for remote data transmission.

'High definition' radar

The introduction of latest generation ultra fast microprocessors has been used to provide more power for signal analysis, enabling more complex processing algorithms to make the application of the radar even more simple and reliable. These latest generation non-contact radar devices have much higher definition in the signal processing and echo analysis. The radars are now looking five times closer for much clearer echo detail, the scale of this achievement can be compared to Hi Definition T.V. for example, which is around two times higher than conventional. So, by using more detailed evaluation of the radar signals (transmitted and received at the speed of light) the radar will gain better differentiation and tracking of actual product level in vessel installations. This will deliver the benefit of higher security for all measurement applications and accommodates the market trend of imple-



VEGAPULS radar has new electronics for higher definition, further options for connectivity and new mechanical configurations for better process compatibility

menting radar into ever smaller vessels, with shorter filling and emptying cycles. The considerably faster signal processing also allows the sensors to follow quick level changes, the result is a reduction in output value reaction times from 250ms, or 4 Hz. Sensor accuracy has also been improved by over 30% for liquids and 7-fold for solids radar. However, all this extra performance consumes even less power than before, it is now the lowest in its class. The new minimum operating voltage, down at 9.6VDC on a stan-



New plug in programmer with clearer menus and faster operational response

dard two-wire device, offers wider compatibility with SCADA, DCS systems, ATEX, wireless, GPRS, battery and solar power installations.

New Styles

This enhanced radar level technology benefits from new interfaces too; in the transmitter head a new plicsplus plug-in PLICSCOM unit provides improved menus and data memory. It can store 100,000 measured values and events with in-head echo curve recording and real-time information to simplify the analysis and diagnosis of applications. It also has an improved key-pad membrane and contrast on the display backlighting. For remote connection, the free download, PACTware set-up software, features the new DTM collection in the new '1.2 specification Style Guide' from the FDT joint interest group. This style guide means devices from all manufacturers should conform to the same layout, look and feel. New DTMs feature improved set up adjustment and diagnosis using 'wizards and assistants', as well as more meaningful menu structures. VEGA is the first to deliver this for its whole sensor range. For AMS and PDM users, EDD's are available. For Asset Management, NE 107 standard messages are used to enable anticipatory maintenance of sensors and effectively protect production processes. This software continues the VEGA 'tradition' over the last 12 years, of enabling the end-user to easily set up devices, "see what the sensor sees" using the echo curve, (as a VEGA service engineer would) carry out false echo mapping and backing-up of sensor data.

Mechanics

On the mechanical side, improved antenna construction with glass sealing of the encoupling system behind the antenna has improved integrity. An extension of the temperature range to -200 up to 450 °C has been achieved with ceramic-graphite antenna options for both VEGAPULS 62 high frequency and VEGAPULS 66 low frequency radar devices. There are also higher chemical resistance metal antennas with new tantalum and titanium coated versions. The VEGAPULS 63 PTFE

flush antenna will now operate from full vacuum to 16 bar and temperature ranges from -175 up to 200 °C. The addition of the two-chamber stainless steel housing, means this new generation radar offers an improved spectrum of options for optimised application compatibility in many areas.

Backwards compatible

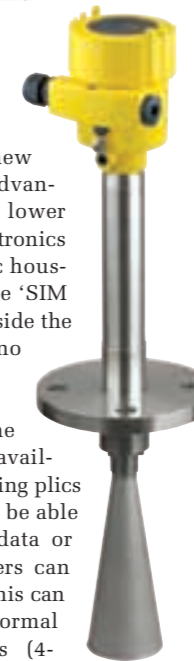
In the development process, special importance was given to ensuring complete backward compatibility between existing plics and new plicsplus instrument adjustments and configurations. Everything fits together wherever possible: new sensors and existing adjustment software and vice versa, new radar electronics and existing housings and antenna systems.

Looking forward

In the coming months, a GPRS/GSM solution will be added to the new radar devices, taking advantage of the new much lower power consumption electronics and two-chamber plastic housing. It will have a simple 'SIM card slot' in a module inside the second chamber with no other external modem boxes or units required, (a special stand-alone housing version will be available to connect into existing plics transmitters). Units will be able to dial out to deliver data or warn of events and users can dial in to get a reading, this can also work alongside normal communication options (4-20mA, HART, Profibus or FF). These GPRS/GSM SIM card devices will be able to be interrogated remotely for commissioning or



New microwave barrier switches called VEGAMIP will be introduced this autumn



maintenance using FDT/DTM PACTware software. Additionally, a rechargeable battery powered 'pack' for remote sites and inventory will also be an option to team up with this configuration, delivering a truly 'stand alone' device for remote sites and locations. Solar and wind power can be used as auxiliary energy sources too. VEGA radar technology will also be introduced into new microwave barrier switches VEGAMIP. These non-contact level switching devices will be introduced this autumn with a selection of antennas, ranges up to 100m and multi-sensor configurations.

If you want to see for yourself, VEGA is offering demonstrations of this new radar technology for customers, contact info@uk.vega.com to arrange a one to one demonstration, or why not an 'early learning breakfast' or 'lunch and learn' seminar at your premises for you and your colleagues? plics@plus radar sensors from VEGA – state-of-the-art technology from the world leader in process radar level measurement. See five new products from VEGA on Stand 1391 at Offshore Europe in Aberdeen 8th to 11th September 2009.

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FDT Style guides are implemented in all VEGA sensors



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