



APPLICATION NOTE Water & Wastewater

Level Measurement of leachate from sewage sludge humification

- Monitoring of a process water tank to control pumps and agitator
- Replacement of an ultrasonic level sensor with a robust and long-term stable 80 GHz radar
- Reliable level measurement independent of wind and weather conditions
- Quick commissioning via mobile app and Bluetooth® connection

1. Background

A municipal utility in eastern Germany operates a state-of-the-art wastewater treatment plant (WWTP) with sustainable sludge treatment. To this end, the company uses the biological dewatering method of sludge dewatering through reed beds (sewage sludge humification).

2. Measurement requirements

In this process, planted beds are periodically fed with sludge from the treatment plant. The basins, typically rooted with reed plants, enable effective decomposition of organic substances and optimal drainage of the sludge with minimal energy input. This method provides highly efficient dewatering and water recovery while significantly reducing disposal costs.

The customer channels the leachate from the reed bed system via collection pipes to a process water storage tank. From there, the collected water is returned to the WWTP process cycle in batches. To correctly control the pumps and agitator of the water storage tank, the operator requires reliable level measurement.

Previously, the customer monitored the level using an ultrasonic sensor from a competitor. Since the measurement point is outdoors, the measuring device was subject to weather fluctuations and wind influences, resulting in unreliable readings. The ultrasonic signal was partially deflected by the wind, leading to frequent false measurements and inefficient process workflows, as pumps and agitators were unintentionally activated. The utility therefore sought an alternative level measurement solution that would work continuously, without contact, and unaffected by existing weather conditions.

3. KROHNE solution

The utility replaced the ultrasonic level sensor with KROHNE's OPTIWAVE 1540 non-contact radar. The 80 GHz radar level transmitter is designed for cost-effective level measurement in open basins and manholes in the water and wastewater industry.

The KROHNE device is entirely made of PVDF, making it highly durable. To optimally protect the radar against dirt, heavy rain, or even flooding, it has an IP68 protection rating. Thanks to its high measurement dynamics, the OPTIWAVE 1540 quickly responds to changing levels and is resistant to condensation and other environmental influences. Additionally, the device offers high accuracy with a measurement error of only ± 2 mm / ± 0.08 in.

The level transmitter was easily mounted at the edge of the basin. Installation was carried out with front-flush antenna using a suitable bracket that KROHNE supplied as part of the solution. Using the installation assistant within the OPTICHECK Level Mobile App, the operator was able to quickly configure the 80 GHz radar via smartphone and commission it through a secure Bluetooth® connection. The customer utilized the preconfigured input mask of the mobile application, requiring only the entry of application-specific parameters such as the water tank height and measurement range, which were then transmitted to the device.



Monitoring the level of a process water storage tank with OPTIWAVE 1540



Installation of OPTIWAVE 1540 using the supplied support

4. Customer benefits

With the OPTIWAVE 1540, the customer now achieves reliable monitoring of the stored water level. If the level exceeds a specified threshold, the pumps and agitators are activated. False activations due to faulty level measurements are now a thing of the past. The cost-effective 80 GHz radar offers a much more robust measuring principle compared to the previous sensor. It operates independently of weather conditions, providing long-term stable and accurate measurements even in the presence of wind or condensation.

The intuitive and user-friendly commissioning assistant significantly simplified and accelerated the device setup. No direct adjustments to the device were necessary, and prior knowledge was not required for commissioning. The mobile app guided the operator through the entire setup process in just a few steps. The OPTIWAVE 1540 was ready for operation after entering basic information.

Thanks to "OPTICHECK technology built-in", the OPTIWAVE 1540 also provides easy access to device diagnostics and reporting functions. This enables the customer to perform on-site verification of the device, including report generation, to check the device status. The operator can perform verification either regularly or as needed, conveniently at the push of a button via the OPTICHECK Level Mobile App.

5. Product used

OPTIWAVE 1540

- Compact 80 GHz radar level transmitter for water and wastewater applications with flush-mounted PVDF Lens antenna



Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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