

Non-contact Laser System Solves Flow Measurement Challenges at Rzeszów Wastewater Treatment Plant



To measure flow rates at two influent channels at a wastewater treatment plant in Rzeszow, Poland, the Municipal Water and Sewage Company (MPWiK Sp. z o.o. w Rzeszowie) decided to install innovative non-contact laser technology. Teledyne ISCO LaserFlow® sensors were placed above the two channels and connected to a Signature® Flowmeter to resolve very challenging conditions without the need for expensive renovations of the channels to build flumes.

Rzeszów WWTP Site Challenges

Shown here is one of two inlet channels at Rzeszów WWTP where poor quality conditions of the wastewater excludes the use of traditional contact sensors.



Accurate flow measurement at the inlet to the WWTP is essential to maintaining optimal settings for the continuously controlled processes involved in clearing sewage and achieving the required levels of pollution reduction. A highly variable sewage inflow, plus rapidly changing hydraulic conditions during rain events, were two of the most important considerations affecting the choice of flow-measurement technology.

These difficulties were further compounded by high concentrations of silt and suspended solids, which prohibited the use of direct-contact sensors, which would have required renovation of the channel floors and costly routine maintenance to keep the direct-contact sensors clean. The ability to instead mount two low-maintenance non-contact sensors above the channels was therefore crucial for the customer.

Installation of LaserFlow™ Sensors

To solve this problem, Teledyne ISCO's distributor in Poland, OMC Envag, recommended placement of LaserFlow sensors above each channel and also performed and validated the installation.



Teledyne's innovative laser-based technology allowed the sensors to be positioned above the two rectangular channels (0.8 m and 1.1 m wide), which had very high sludge buildup (0.1 m and 0.3 m). The two 360 TIENet Laserflow Sensors were connected to a single Signature Flowmeter. Depending upon sensor selection, the Signature is capable of operating with up to nine connected sensors. All readings are relayed continuously to the SCADA system of the WWTP.

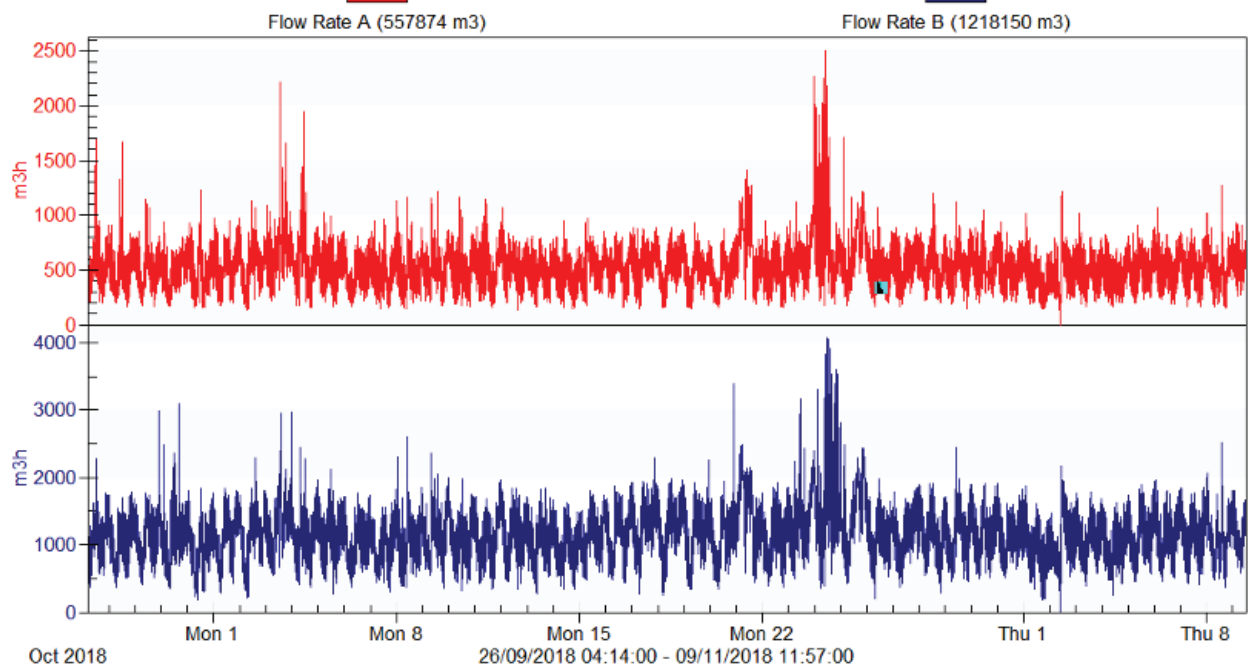
Accurate Flow Rate Measurement

The graph below shows the flow rates from the two parallel but independent inlet channels. The different flow rates resulted from different hydraulic conditions, channel dimensions, and silt levels in each channel.

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RZESZOW WWTP

Two rectangular inlet channels



Substantial Cost Savings

Because the LaserFlow was able to adapt to the existing channel conditions, the investment required for accurate and reliable flow measurement was approximately 30% lower than having to rebuild the works to install physical contact structures such as flumes. Further, despite the difficult site conditions, the maintenance cost using LaserFlow non-contact sensors is reduced to near zero.

Customer Feedback

Thanks to the unique non-contact laser technology, the Teledyne ISCO flow-measurement system was able to adapt to the existing channels without the need to rebuild. This installation has been working very efficiently since July 2018.

360 TIENet Laserflow® Sensor

The TIENet™ 360 LaserFlow™ sensor is an area-velocity flow and water-level measurement device that remotely senses flows in open channels using non-contact Laser Doppler Velocity Sensing and non-contact Ultrasonic Level Sensing technologies. The sensor uses advanced technology to measure velocity with a laser beam directed at single or multiple points below the surface of the wastewater stream. Therefore, unlike radar technology, it does not require the creation of ripples on the surface of the stream.



- Rugged, submersible enclosure with IP68 ingress protection
- Zero deadband from measurement point in non-contact level and velocity measurements Continuous measurements in submerged conditions
- Advanced velocity diagnostics for data quality evaluation and analysis
- Bidirectional velocity measurement
- Low level velocity measurement
- Up to 9 sensors can be connected to one Signature Flowmeter

Signature® Flowmeter

The Signature Flowmeter from Teledyne ISCO, designed for open channel flow monitoring, supports flow measurement methods including bubbler, non-contact laser area velocity, ultrasonic, and submerged Doppler ultrasonic area velocity.



With the ability to connect up to 9 sensors, the Signature Flowmeter provides a broad range of I/O and communications options:

- pH and temperature
- SDI-12
- RS485
- 4-20 mA output
- Ethernet
- GSM/GPRS modem

The Signature Flowmeter is rugged (IP 66) even if the cover of the lid is open. It performs data logging with variable rate data storage and data integrity verification, and has the ability to connect a USB drive for data/report retrieval and programming.

About Teledyne ISCO

Teledyne ISCO is a leading manufacturer of a wide range of innovative products designed to increase productivity while improving the quality of life on our planet. Our standard and customized products are used across multiple sectors including water and wastewater, pharmaceutical, academia, oil exploration, and reactant feed. Teledyne ISCO is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.

For further information contact your local Teledyne ISCO representative.