

Stormwater Monitoring

Biberach, Germany

Case Study

Expertise in Flow



Signature Flow Meter

- Smart sensor interface (TIENet)
- Multiple simultaneous technologies including:
 - Non-contact Laser Area/Velocity
 - Contact Doppler Area/Velocity
 - Bubbler
 - Ultrasonic
- Connect up to 9 sensors simultaneously
- I/O options and communication:
 - pH/ temperature
 - SDI-12
 - RS485 input/output
 - 4-20mA output
 - Ethernet
 - GSM/GPRS modem.
- Rugged (IP66) even if cover lid is open
- Data logging with variable rate data storage
- USB drive for data and report retrieval, and programming.
- Data Integrity Verification

The Signature Flow Meter with TIENet 350 Area Velocity (AV) Sensor from Teledyne Isco is used for stormwater monitoring at a wastewater treatment plant (WWTP) in Biberach, Germany. The results are used to estimate runoff from the WWTP.



Stormwater pipe to be monitored & Signature Flow Meter

Rain Retention Basin Overflow Monitoring

Combined sewer systems where both wastewater and rain water arrive at the inlet of a WWTP can be challenging. During rain events, the water volume could become greater than the plant capacity. To protect the treatment process, the WWTP AZV Riß diverts a portion of the incoming water into large rain retention basins. These basins act as a storage and pre-treatment area where larger particles settle to the bottom. The water is then pumped to the inlet as time and capacity allow. If the rain event is large, the retention basins might become full. During such events, the water is released directly to the river without any other treatment than the settling process of larger particles. The WWTP must report to local authorities the number of events, time period of each event, and quantity of untreated water that has been released directly into the river. A reliable system for monitoring of flow in a stormwater pipe leading from the retention basins was therefore needed.

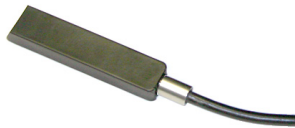
Site Challenges

A stormwater pipe is normally empty; water is only present a few times during the year, requiring flow monitoring. The volume of water can vary greatly, depending on the size of the event. The pipe's large dimensions make the installation of a primary device such as a weir or flume technically difficult and/or costly. AZV Riß concluded that the best solution was an area velocity flow meter that could remain stable over extended dry periods, and handle rapid changes in temperature and flow rates during rain events.

TIENet 350 Area Velocity Flow Sensor

After careful review with Teledyne Isco's distributor Deinlein & Lunz Umwelttechnik GbR, the WWTP AZV Riß selected the Signature Flow Meter with 350 TIENet AV sensor to install in the stormwater pipe. The Signature/ 350 TIENet Flow System utilizes optimized Doppler technology to accurately measure the true average velocity across the entire flow section, in a wide range of applications.

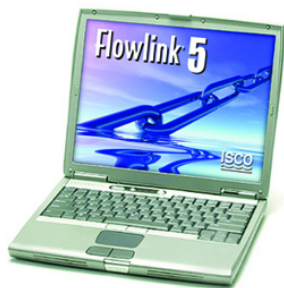




TIENet 350 Area Velocity Sensor

Features and Benefits:

- Digital sensor smart sensor measures both level and velocity
- Low level velocity measurement
- No velocity profiling needed during installation
- Factory calibration stored in sensor ensures long-term stable level readings
- No level span calibration needed
- Advanced velocity diagnostics for data quality evaluation and analysis



Flowlink 5.1 Software

Features and Benefits:

- Graphical and tabular reports
- Data editing
- Diagnostics
- Export/ import
- Automated tasks

The 350 is a smart sensor with built-in digital electronics, with all depth and velocity signals processed within the sensor itself. The sensor stores its own temperature and pressure calibration data for the entire measurement span (0-3 m) internally, eliminating temperature drift, providing long-term stability, and eliminating the need for span recalibration. This makes the sensor ideal for stormwater applications with extended dry periods. Velocity quality and diagnostic data can be logged for every reading, providing data verification, as well as excellent real-time evaluation of site conditions during installation or post-analysis.

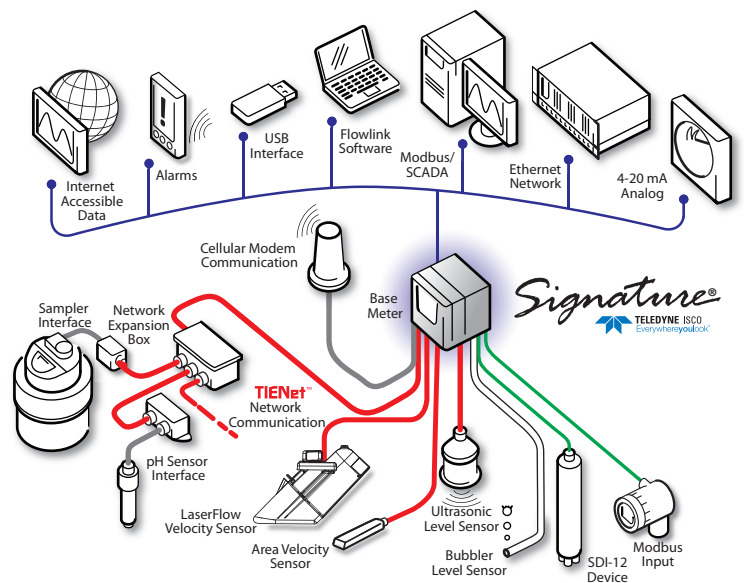


TIENet 350 Doppler AV operation



TIENet 350 AV sensor
Mounted in stormwater pipe

The Signature Flow Meter provides a powerful and flexible system with multiple smart sensor interfaces and multi-parameter options. The enclosure is weather resistant (IP66) even if the protective front cover is opened. Data and reports can easily be retrieved through a USB interface, and a unique verification tool ensures the integrity of all logged data.



Signature Flow Meter input and output options

Customer Feedback

“The Teledyne Isco Signature Flow Meter with 350 TIENet Area Velocity sensor has been installed and in operation since early 2013. The system is working well with our expectations and has measured every overflow event that has occurred. The 350 TIENet Area Velocity sensor has been stable over time with no re-calibration needed. The Signature Flow Meter is easy to install, with little maintenance. The flexibility of the system makes it easy to upgrade and can meet any of our future needs.” – Plant Manager Maier, ANZ RiB