LaserFlow™ Velocity Sensor and Signature® Flow Meter: Redundant Flow Measurement

TELEDYNE ISCO
Everywhereyoulook™

Expertise in Flow

LaserFlow™ Velocity Sensor

Standard Features

- Non-contact velocity and level measurement
- Single or Multiple Point measurement below liquid surface
- Rugged, submersible enclosure with IP68 ingress protection
- Zero deadband from measurement point in non-contact level and velocity measurements
- Quality readings without manual profiling
- Bidirectional velocity measurement

Signature® Flow Meter

Standard Features

- Multiple parameter data logging
- Program & summary reports
- Data integrity verification
- Triggering, sampler enabling
- Compatibility with Flowlink® software
- Multiple simultaneous flow technologies
- pH and temperature input
- SDI-12 input
- RS-485 input
- RS-485 output
- Analog outputs
- Remote communication via cell phone or Ethernet

Wastewater collections personnel at a Pennsylvania municipality faced a complex flow monitoring application which required a flexible and accurate solution. The city had incurred significant expense in installing a flume at a key monitoring location, only to have the device overwhelmed during critical high flow conditions when accurate flow data was most needed. Estimated costs for replacing the flume with a larger device were not cost-effective and still carried no guarantee of proper operation during the most extreme infiltration and inflow events.

Figure 1: (Left) Aerial view of the LaserFlow manhole, Signature flow meter and flume vault locations

Figure 2: (Right) Street view of the LaserFlow manhole, Signature flow meter and flume vault locations

To resolve this challenging combination of conditions, the municipality chose to install the Teledyne Isco TIENet™ Signature flow meter to monitor multiple sensors simultaneously during changing flow conditions. Additionally, the flow meter was equipped with the optional cellular modem option to enable remote monitoring and alarming.

To monitor the flow in the flume vault during normal conditions, a TIENet™ remote 310 ultrasonic sensor was mounted using the floor mount for horizontal surfaces. See Figure 4.

To monitor the flow during the submerged flume conditions, the LaserFlow sensor was installed upstream. Additionally, the optional TIENet™ 350 Area Velocity sensor was mounted to the bottom of the LaserFlow for flow measurement during submerged conditions. This

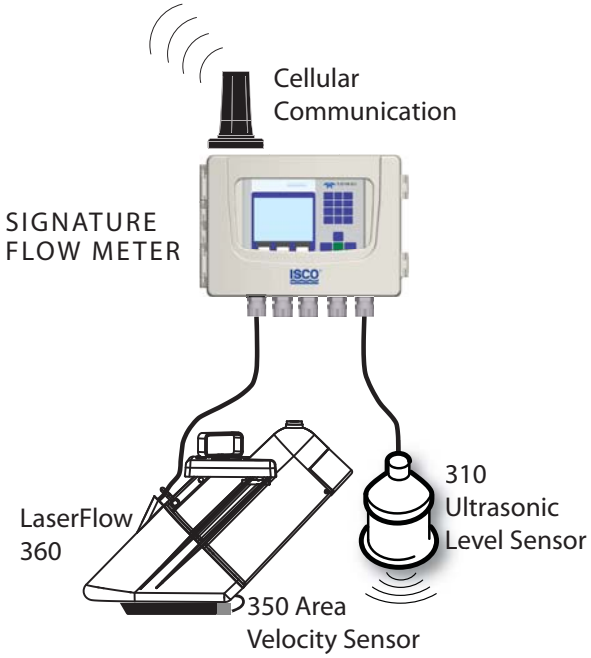


Figure 3: Multiple sensors connected to a Signature flow meter

310 Ultrasonic Level Sensor

Standard Features

- Non-contact velocity and level measurement
- Transmits sound pulses reflected off liquid surface

350 Area Velocity Sensor

Standard Features

- Differential Pressure Level measurement
- When mounted on bottom of LaserFlow sensor, takes over flow rate measurement during submerged conditions

Flowlink Pro Software

Standard Features

- Communicates with site instruments for configuration, data retrieval and data recording
- Connects to the site Code Division Multiple Access (CDMA) or Global System for Mobile Communications (GSM) modem via cellular telecommunications service

sensor provides continuous wave Doppler to measure area velocity with a differential pressure transducer to measure level. This method allows continuous flow monitoring of the manhole during submerged conditions.

Following the discharge event, data from the three flow conditions was collected using Teledyne Isco Flowlink software. The advanced technology of the Signature flow meter with its TIENet™ network capabilities enabled the municipality to obtain data from the three sensors with a single download and generate an accurate flow discharge report.

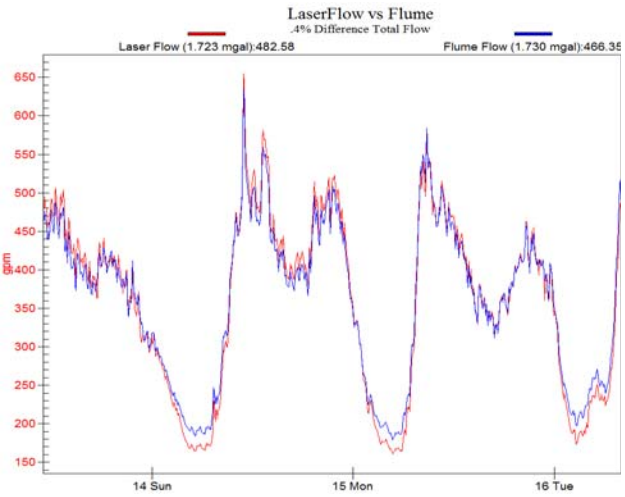
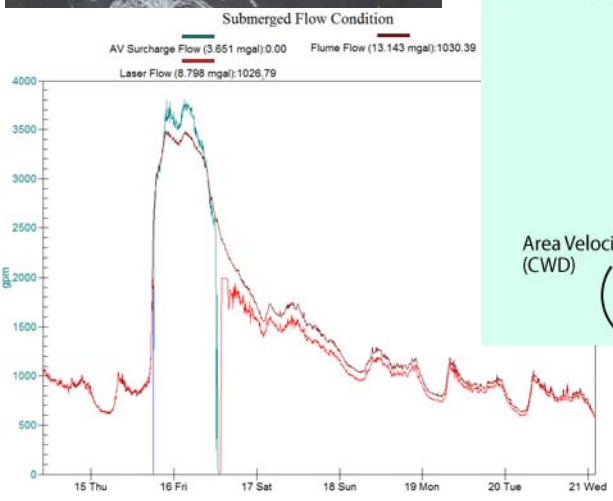


Figure 4: (Top Left) The graph displays how the advanced laser technology verifies the accuracy of the flume under normal flow conditions.
Figure 5: (Top) The TIENet™ 310 ultrasonic level sensor determines the flow rate in the flume vault.
Figure 6: (Left) The LaserFlow sensor operating under normal flow conditions.
Figure 7: (Bottom Left) The graph displays the operation of the 350 sensor during submerged flow conditions.



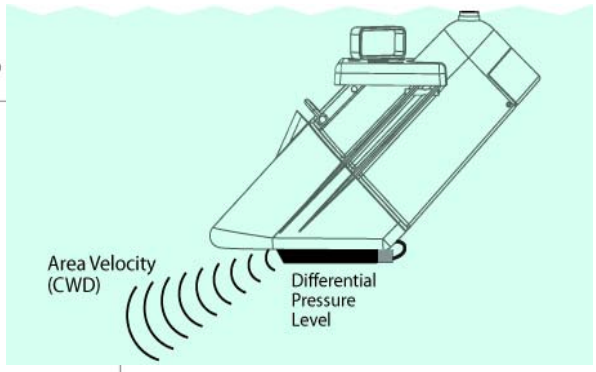


Figure 8: (Above) When water reaches the LaserFlow, the optional 350 area velocity sensor takes over flow rate measurement.

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