

Measuring flow in an irrigation channel

Application Note: W-AN23



Industry

Irrigation

Application

Irrigation channel

Significant Issues

- Fouling of wetted sensors
- Continuous maintenance of in-stream devices and wetted sensors
- Accuracy

Application

For control and billing purposes, flood control water conservation and irrigation districts measure flow in large open channels that transport irrigation water. Typical flow measurement, test, and verification locations are large trapezoidal shape, concrete or natural non-uniform channels with either constant or varying channel bottoms. Irrigation Districts desire accurate flow measurement while avoiding high-maintenance needs associated with wetted sensors and in-stream devices.



Solution

The Teledyne ISCO LaserFlow non-contact velocity sensor is ideal for this difficult yet critical measurement, especially when significant varying flow conditions are present. Fouling isn't an issue as the LaserFlow sensor is mounted above the flow. LaserFlow's ability to measure velocity sub-surface while staying above the flow stream allows for high accuracy yet requiring minimal maintenance. Combining LaserFlow with either the Signature or DuraTracker flow meter meets and exceeds the accurate, reliable data requirements of irrigation districts

Benefits

- Non-contact solution
- Fast, simple installation and operation
- Highly accurate
- No need to install wetted sensors during off-season when channel is dry
- No fouling issues or sensor maintenance

LaserFlow® Non-Contact Velocity Sensor

The TIENet 360 LaserFlow sensor is a non-contact, 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 water stream. Therefore, unlike radar technology, it does not require the creation of ripples on the surface of the stream.

- 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
- For applications within the United Kingdom requiring certification by The Environment Agency, LaserFlow is designated MCERTS Class 2.
- Also available is the intrinsically safe LaserFlow Ex. The LaserFlow® Ex can be installed in hazardous areas defined as Class 1, Div 1, Zone 0, ATEX category 1G.



Signature® Flow Meter

The Signature flow meter from Teledyne ISCO, designed for open channel flow metering, supports flow measurement methods including bubbler, non-contact laser area velocity, ultrasonic, and submerged Doppler ultrasonic area velocity. Up to nine sensors can be connected to the Signature, providing a broad range of I/O and communications options:

- pH and temperature
 - SDI-12
 - RS485
- The Signature flow meter 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.



DuraTracker® Flow Meter

The DuraTracker is the most efficient and reliable flow measurement solution on the market today for open channel flow measurement. It supports flow measurement technologies including non-contact laser area velocity, submerged Doppler area velocity, and ultrasonic. The intrinsically safe DuraTracker Ex provides the same benefits for use in hazardous areas classified as Class I, Div 1, Zone 0, ATEX Category 1G.

Standard Features

- Rugged, submersible enclosure meets IP68 environmental specs
- Quick connect plug-and-play multiple sensors connectivity: Ultrasonic, AV, and laser pH and sampler interface
- Bluetooth communication interface with wireless devices
- USB interface
- MODBUS output
- Replaceable high-capacity internal desiccant cartridge and GORE-TEX® filter protect sensor air reference port from water entry and internal moisture
- Variable data-rate storage
- Compatible with off-the-shelf batteries

