

LaserFlow[®] Ex

Intrinsically Safe, Non-Contact Subsurface Velocity Sensor

The LaserFlow[®] Ex velocity sensor remotely measures flow in open channels with non-contact Laser Doppler Velocity technology and non-contact Ultrasonic Level technology. The sensor uses these advanced methods to measure velocity with a laser beam at single or multiple points below the surface of the wastewater stream. The sensor can be installed in hazardous areas defined as Class 1, Div 1, Zone 0.

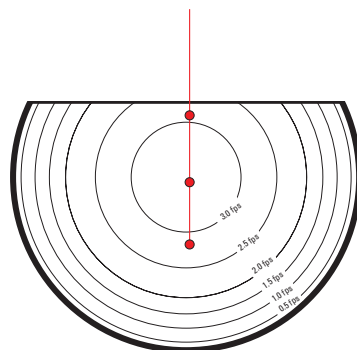
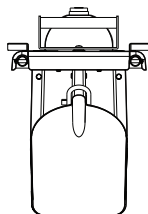
The only non-contact flow measurement device to read below the surface.

The sensor uses an ultrasonic level sensor to measure the level and determines a sub-surface point to measure velocity. The sensor then focuses its laser beam at this point and measures the frequency shift of the returned light.

The LaserFlow Ex is ideal for a broad range of wastewater monitoring applications. With Teledyne ISCO's TIENet[™] Barrier, it is compatible with both the Teledyne ISCO Signature[®] Flowmeter and the 2160 LaserFlow Module, depending on the type of installation.

With its specially designed mounting bracket in place, the LaserFlow Ex can be deployed and removed from street level. This avoids the risk and expense of confined space entry. A variety of communication options enable programming and data retrieval from a remote location. Information about data quality can be recorded and transmitted with the flow data.

Additionally, built-in diagnostic tools simplify installation, maintenance, and advanced communication options reduce site visits.



The LaserFlow device can be programmed to take velocity measurements at single or multiple points below the water's surface.



LaserFlow[®]

Applications:

- Hazardous Area Installations
- Flow measurement for CSO, SSO, I&I, SSEs, CMOM, and other sewer monitoring programs
- Wastewater treatment plant influent, process, and effluent flow measurement
- Industrial process and discharge flow measurement
- Stormwater conveyance and outfall
- Shallow flow measurement in varying pipe sizes

Standard Features:

- Intrinsically Safe Class 1, Div 1, Zone 0
- Non-contact velocity and level measurement
- Single or multiple point measurement below the 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

LaserFlow® Ex Sensor

Size (H x W x D):	18.0 x 9.5 x 23.5 in (45.7 x 24.1 x 59.7 cm)
Weight :	24.8 lbs (11.25 kg)
Materials:	Conductive Carbon Filled ABS, SST, Conductive Kynar® ^a , Anodized Aluminum, UV Rated PVC
Cable Lengths:	32.8 or 75.5 ft (10 or 23 m) ^b
Enclosure:	IP68
Certifications:	Class I, Division 1, Groups C-D, T4 Exia Class I, Zone 0, AEx ia op is IIB T4 Ga ⚠ II 1 G Ex ia op is IIB T4 Ga IECEx ia op is IIB T4 Ga
Laser Class:	Class 3R
Temperature Range:	Operating: 14 to 140 °F (-10 to 60 °C) Storage: -40 to 140 °F (-40 to 60 °C)
Power Required:	Input voltage: 8 to 26 VDC 11.5 VDC Nominal
Flow Accuracy:	±4% of reading ^c
Communication Protocol:	TIENet™

Velocity

Technology:	Non-Contact, Subsurface Laser Doppler Velocity (patented)
Measurement Range:	0 to 15 ft/s (0 to 4.6 m/s)
Maximum distance from liquid surface to bottom of sensor:	10 ft (3 m)
Minimum depth:	0.5 in (0.01 m) ^c
Accuracy:	±0.5% of reading 0.1 ft/s (±0.03 m/s)
Minimum Velocity:	0.5 ft/s (0.15 m/s)

Level

Technology:	Non-Contact Ultrasonic
Measurement Range:	0 to 10 ft (0 to 3 m) from measurement point
Accuracy @ 72 °F (22 °C)	0.02 ft (±0.006 m) at <1 ft level change 0.04 ft (±0.012 m) at <1 ft level change
Temperature Coefficient within compensated range:	± 0.0002 x D (m) per degree C ± 0.00011 x D (ft) per degree F (D = Distance from transducer to liquid surface)
Beam Angle:	10° (5° from center line)
Ultrasonic Signal:	50 KHz
Deadband:	Zero deadband from bottom of LaserFlow sensor ^d

Options and Accessories

- Redundant flow measurement with simultaneous Continuous Wave Doppler or Ultrasonic Level Sensing
- Permanent mounting hardware
- Sensor retrieval arm enables installation and removal without confined space entry
- Remote ultrasonic level sensor options for drop manhole and outfall applications



TIENet™ Barrier device provides safe electrical connections that allow the sensor to be installed in Intrinsically Safe areas.



IP66 enclosure for TIENet™ Barrier device.

^a Kynar® is a registered trademark of Arkema, Inc.

^b Custom cable lengths also available.

^c Under normal flow conditions.

^d Deadband for remote TIENet™ 310 ultrasonic level sensor varies, depending on the type of mounting hardware.

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Teledyne ISCO is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.

